

THE NACCO MINING COMPANY  
APPLICATION FOR INCIDENTAL BOUNDARY REVISION

# THE NACCO MINING COMPANY

POWHATAN POINT, OHIO 43942

January 23, 1985

Mr. Larry Mamone, Chief  
Division of Reclamation  
Ohio Department of Natural Resources  
Fountain Square - Building B  
Columbus, Ohio 43224

Dear Mr. Mamone:

The Nacco Mining Company proposes to construct a new ventilation fan shaft at its Powhatan No. 6 Mine. Attached, please find the Application for Incidental Boundary Revision for Airshaft No. 4.

Please contact me upon completion of your review.

Very truly yours,

THE NACCO MINING COMPANY



Louise Watson  
Draftsperson - Engineering

LW:crm  
Attachment

Copies to: J. Sprouse (O.D.N.R.)  
A. Jerico  
B. Kranz  
File

TOVCC 16919

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF RECLAMATION  
Fountain Square  
Columbus, Ohio 43224

APPLICATION FOR AN INCIDENTAL BOUNDARY REVISION  
This Form Cannot Be Utilized For The Removal Of Coal  
(File in Quadruplicate)

- 
1. Permittee's Name The Nacco Mining Company Phone # (614) 926-1351
2. Address 86854 Pleasant Ridge Road Zip Code 43902  
Alledonia, Ohio
- 
3. Coal Mining Permit # D-0360
4. Additional acres to be permitted 6.4 ac.
5. Has this acreage been affected? Yes \_\_\_\_\_, No X
6. Describe the reason this additional acreage is required.  
The Nacco Mining Company proposes to construct a new air shaft for ventilation of its underground mine facilities.
7. Describe the activities to be conducted on this area.

See Page 2.1

8. Is the information contained in the previously approved permit application applicable to this revised area? Yes \_\_\_\_\_, No X.

If "no", describe any changes to the previously approved permit application that will apply to this revised area.

See Page 4 Right of Entry  
See Page 5 Prime Farmland Determination  
See Page 6 Valid Existing Rights  
See Page 7 Land Use Capabilities  
See Page 8 Protection of Public Roads  
See Page 9 Mine Seals  
See Page 10 Hydrologic Impact  
See Page 11 Sediment Pond Variance Request

(continued on reverse side)

Description of Activities

The site is situated on State Route 7 at the crown of a sloping hillside. Topsoil is very shallow in most areas, and rock benches occur at various elevations along the East edge of the property. The land is currently being used for pasture, and the steeper slopes, which will not be disturbed, are wooded.

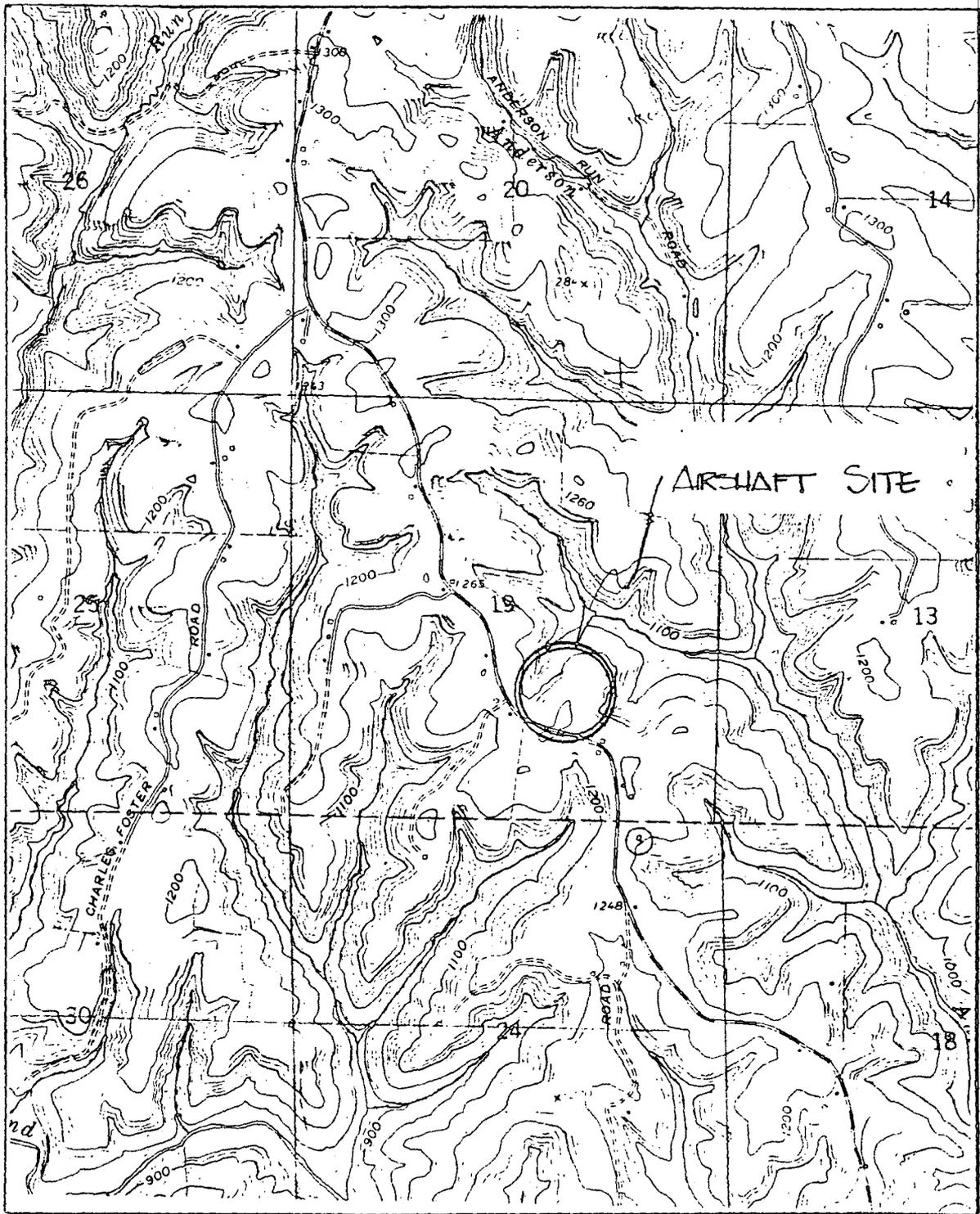
Topsoil will be removed from the site, as indicated on Map 6-018-4, and stockpiled along the parameter of the site. These stockpiles will be planted with the herbaceous plant material as specified, and when all settling of the piles is completed, fast growing tree varieties will be planted, creating a screen.

The site will be graded, keying the soil into the existing hillside, and each addition of fill will be compacted with a sheeps foot roller. The toe of the fill will reach to the rock bench at elevation 1230+, and will have a final slope of 2½:1.

The air intake shaft will be developed in 1985. A pilot hole will be drilled from the surface to the mine workings, and tailings from this hole will be pumped to the temporary pond illustrated at the North end of the site. This pond will be removed when the pilot hole is complete. The 12" CMP decant will be monitored at each discharge for settleable solids. The completed shaft will be 18' in diameter, and will be drilled from the mine workings. All spoil from this development will be handled in the mine.

The fan shaft, illustrated on the map, will be installed in 1986. Construction techniques for this shaft will be identical. It is proposed that this site will be used as a man portal. Approximately 100 men, per shift, will enter the mine workings here. At no time will coal be removed from the mine at this site.

Upon final cessation of operations at this site, all mine openings will be appropriately sealed, and reclamation, per specifications described in Permit D-0360, will be completed.



GENERAL LOCATION MAP  
 ARMSTRONG MILLS QUADRANGLE - USGS 7.5 MIN.

TABLE 3

RIGHTS OF ENTRY

WUSACK REALTY  
224 HOWARD ST.  
BRIDGEPORT, OHIO 43912

OPTION TO PURCHASE

in consideration of the payment by MARIO D. BUSACK JR., Real Estate Broker, hereinafter referred to as Optionee, in the amount of \$ 10.00 (Ten and no/100) DOLLAR receipt of which is hereby acknowledged, Michael P. Kotlar and SANDRA K. Kotlar, hereinafter referred to as Optionor, grants to Optionee an option to purchase the real property situated in City of Township of Smith, County of Belmont, State of Ohio, described as being in the Southeast quarter of Section 19, Township, Range 4 and consisting of 20 acres more or less for a PURCHASE PRICE OF \$ 50,000.00 (Fifty thousand) DOLLAR upon the following TERMS and CONDITIONS:

- 1) PERMANENT EASEMENT FOR SEPTIC SYSTEM.
- 2) REASONABLE TIME TO RELOCATE CABLE.
- 3) 100 FEET FRONTAGE FOR ACCESS OF Rt. 4. Beginning at CORNER of Existing PROPERTY.

ENCUMBRANCES: In addition to any encumbrances referred to above, Optionee shall take title to the property subject to: 1) Real Estate Taxes not yet paid and 2) Covenants, conditions, restrictions, reservations, rights, rights of way and easements of record, if any, which do not materially affect the value intended use of the property.

The amount of any bond or assessment which is a lien shall be  paid,  assumed by Optionor.

EXAMINATION OF TITLE: Fifteen (15) days from date of exercise hereof are allowed the Optionee to examine the title to the property and to report writing any valid objections thereto. Any exceptions to the title which would be disclosed by examination of the records shall be deemed to have been accepted unless reported in writing within said 15 days. If Optionee objects to any exceptions to the title, Optionor shall use all due diligence to remove such exceptions at his own expense within 60 days thereafter. But if such exceptions cannot be removed within the 60 days allowed, all rights and obligations hereunder may, at the election of the Optionee, terminate and end, and the option payment shall be returned to Optionee, unless he elects to purchase the property subject to such exceptions.

EVIDENCE OF TITLE: Evidence of Title shall be in the form of  a policy of title insurance,  other: MARKETABLE EXERCISE to be paid for by Optionor.

CLOSE OF ESCROW: Within          days from exercise of the option, or upon removal of any exceptions to the title by the Optionor, as provided above whichever is later, both parties shall deposit with an authorized escrow holder, to be selected by the Optionee, all funds and instruments necessary to complete the sale in accordance with the terms and conditions hereof.

POSSESSION: Possession shall be delivered to Optionee.  Upon recordation of the deed.  After recordation, but not later than         . Unless Optionor has vacated the premises prior to recordation of the deed, Optionor agrees to pay Optionee \$          per day from recordation to date possession is delivered and to leave this sum in escrow to be disbursed to the persons entitled thereto on the date possession is delivered.

PRORATIONS: Rents, taxes, premiums on insurance acceptable to Optionee, interest and other expenses of the property to be prorated as of recordation. Good Security deposits, advance rentals or considerations involving future lease credits shall be credited to Optionee.

MAINTENANCE: Until possession is delivered Optionor agrees to maintain heating, sewer, plumbing and electrical systems and any built-in appliances and equipment in normal working order, to keep the roof watertight and to maintain the grounds.

NOTICES: By acceptance hereof, Optionor warrants that he has no notice of violations relating to the property from City, County or State agencies.

TERM: Time is of the essence of this agreement.

EXPIRATION OF OPTION: If not exercised, this option shall expire 60 days from date and Optionor shall be released from all obligation hereunder and all of Optionee's rights hereunder, legal or equitable, shall cease and the consideration hereinabove received for by Optionor shall be retained by Optionor.

EXERCISE OF OPTION: The option shall be exercised by mailing or delivering written notice to the Optionor prior to the expiration of this option and to additional payment, on account of the purchase price, in the amount of \$ 5,000.00 (FIVE THOUSAND AND NO/100) DOLLAR for account of Optionor to the authorized escrow holder referred to above, prior to the expiration of this option.

Notice, if mailed, shall be by certified mail, postage prepaid, to the Optionor at the address set forth below, and shall be deemed to have been given upon the day following the day shown on the postmark of the envelope in which such notice is mailed.

In the event the option is exercised, the consideration hereinabove received for by Optionor  shall  shall not be credited upon the purchase price.

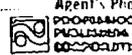
NOTICE: The amount and rate of real estate commissions is not fixed by law. They are set by each Broker individually and may be negotiable between the Seller and Broker.

CONVEYANCE FEE: Upon execution of this option the Optionor agrees to pay to N/A, the Agent in this transaction, the sum of \$          (DOLLARS) and in the event the option is exercised, Optionor agrees to pay Agent the additional sum of \$ N/A (DOLLAR) for services rendered. This agreement shall not limit the rights of Agent provided for in any listing or other agreement which may be in effect between Owner and Agent. In the event legal action is instituted to collect this fee, or any portion thereof, the Optionor agrees to pay the Agent a reasonable attorney's fee and all costs in connection with such action.

DATED: 29 Sept 1984

Michael P. Kotlar Optionor Mario D. Busack Jr Optionee  
Sandra K. Kotlar Optionor Real Estate Broker Optionee  
59165 ARMSTRONG - CENTERVILLE RD. Address 224 Howard St Bridgeport Address  
Jacobburg 686-2070 Phone 614-635-3525 Phone  
BUSACK REALTY Agent 224 Howard St Bridgeport, OH Agent's Address

By Mario D. Busack Jr (614) 635-3525  
Real Estate Agent  
WORLDWIDE CO 3006 COPYRIGHT 1980 DODGE PUBLISHING CORP 123 PAUL DRIVE DAN RAFAEL CA 94603 ALL RIGHTS RESERVED





PRIME FARMLAND DETERMINATION

PROTECTION OF PUBLIC ROADS

PROTECTION OF PUBLIC ROADS

The permit area of Powhatan No. 6 affects lands that are within one hundred feet of State Route 148. The offices, preparations plant and mine entrances are to the north of the highway and the clean coal pile and rail load-out are to the south. The clean coal conveyor belt crosses overhead. The maintenance road, which is to the north serves as a private access for passenger and light duty vehicular traffic.

The access route to the clean coal pile receives only intermittent use and normally only light duty vehicles are necessary for any work to be performed in that area.

Powhatan No. 6 has, in conjunction with its underground workings, three ventilation fans at remote sites. Two of which have access points on State Route 9, and the other at Township Road 103. Each access road is surfaced with a durable, non-eroding material, and is normally traveled by only passenger vehicles.

MINE SEALS

1. Air Intake - To be constructed in 1985
2. Air Return with Fan - To be constructed in future

HYDROLOGIC IMPACT

## HYDROLOGIC IMPACTS

Little or no degradation or diminution of surface or groundwater is expected as a result of the construction of this air-shaft.

During the development of the 6.4 acre site for the No. 4 Airshaft, all existing vegetative cover will be removed, the area regraded to create a more level area, and paved with a durable material. This will cause a local increase in quantity and rate of surface water runoff. Most of this flow will ultimately enter the small stream adjacent to the site. Due to the relatively small size of the site and the limited extent of disturbance, no significant affects are anticipated.

The shaft itself will be 18' in diameter and entirely cased in concrete. Past experience has illustrated that small amounts (approximately 2 g.p.m.) of groundwater travel down along the outer face of the concrete casing and enter the mine workings. This is collected with the rest of the mine water.

SEDIMENT POND VARIANCE REQUEST

# THE NACCO MINING COMPANY

POWHATAN POINT, OHIO 43942

March 27, 1985

Mr. Larry Mamone, Chief  
Division of Reclamation  
Ohio Department of Natural Resources  
Fountain Square, Building B  
Columbus, OH 43224

Dear Mr. Mamone:

The Nacco Mining Company, which owns and operates the Powhatan No. 6 Mine, requests variance approval from the sedimentation pond requirements in 1501:13-9-04 of the Ohio Administrative Code be granted at its 6.4 acre Air Shaft No. 4 site. The site will be paved with a durable, non-eroding material, and all surface drainage will be maintained with appropriate grass line diversion ditches.

Very truly yours,

THE NACCO MINING COMPANY

Louise Watson  
Permit Coordinator

LW:jlr

TOVCC 16933

#### ALTERNATE SEDIMENTATION CONTROLS

The areas designated as topsoil stockpiles will be seeded with an appropriate grass and legume mixture. The grass lined diversion ditches surrounding the pile will be stabilized with straw bale dams, placed on 50' centers.

OHIO DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF RECLAMATION

ATTACHMENT 4  
(ADJACENT OWNERS)

Applicant's Name The Nacco Mining Company

This attachment is to be completed and submitted with the permit application if the response to item A. (12) in Part 1 of the permit application is "yes".

Name of owner Pack, Alan A. and Arlene L.

Address RD #2

City Triadelphia State WV Zip 26059

Surface,  Mineral

Name of owner Napier, David

Address Rt. 2

City Jacobsburg State Ohio Zip 43933

Surface,  Mineral

Name of owner Ewing, William R. and Marsha K.

Address 59247 Armstrong-Centerville Road

City Jacobsburg State Ohio Zip 43933

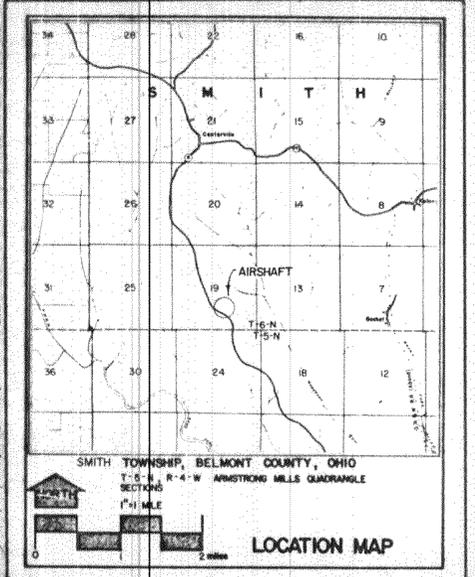
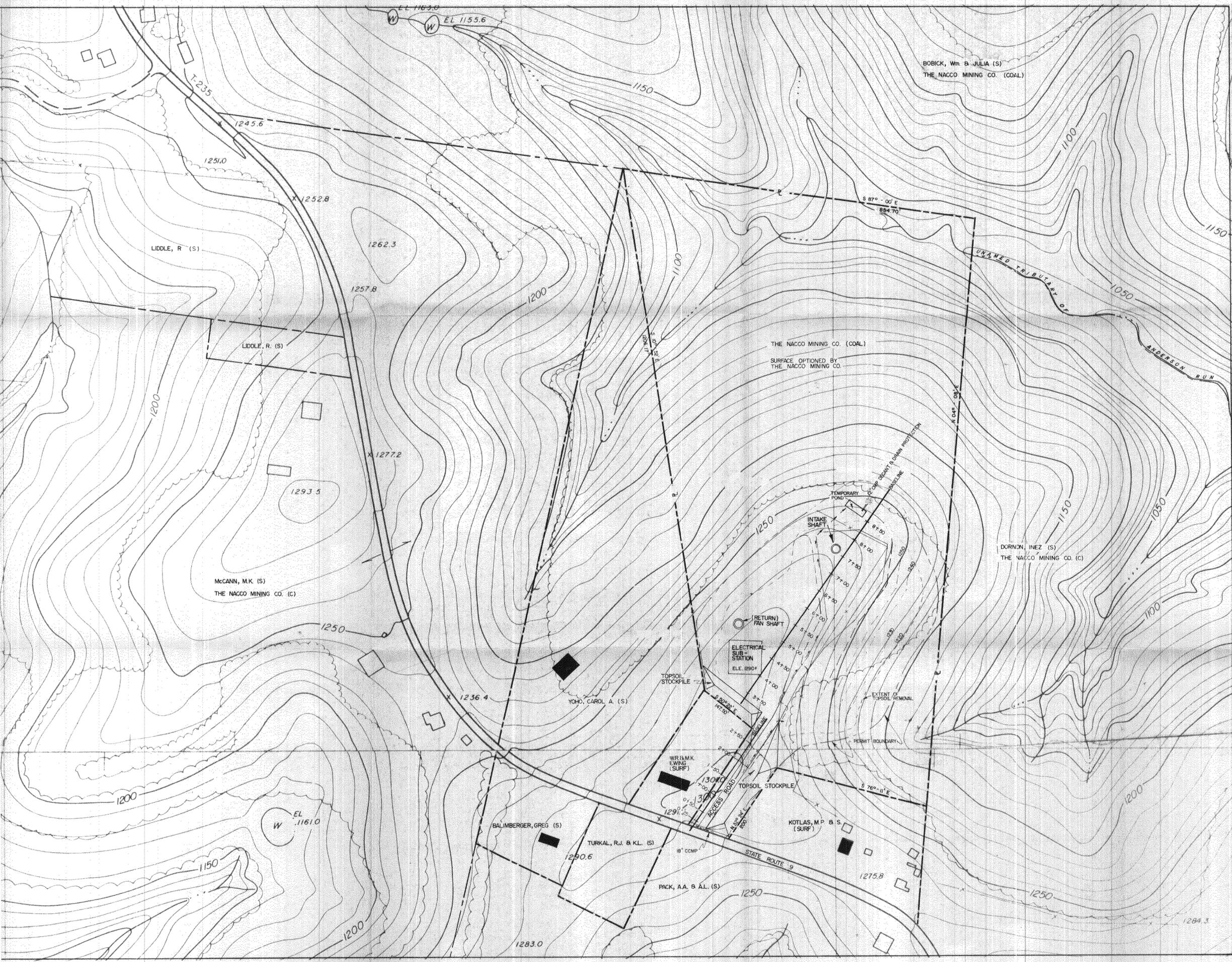
Surface,  Mineral

Name of Owner Kotlas, Michael P. and Sandra K.

Address 59185 Armstrong-Centerville Road

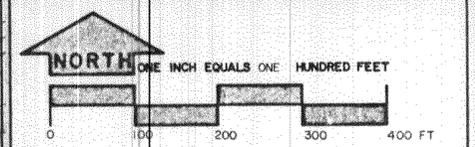
City Jacobsburg State Ohio Zip 43933

Surface,  Mineral



- MAP SYMBOLS**
- OCUPIED DWELLING
  - UNOCCUPIED BUILDING
  - PUBLIC BUILDING
  - SCHOOL
  - CHURCH
  - COMMERCIAL/BUSINESS BUILDING
  - COAL OUTCROP
  - UTILITY
  - TEST BORING
  - ENTRANCE SIGN
  - PROPERTY LINE
  - PERENNIAL STREAM
  - INTERMITTENT STREAM
  - CONSTRUCTED DRAINWAY
  - SEDIMENT POND
  - ACTIVE MINING AREA
  - TREE PLANTING AREA
  - WATER TREATMENT FACILITY
  - PUBLIC WATER LINE
  - SEEP, SEEPAGE ZONE, SWAMP
  - DEEP MINE ENTRY
  - DEEP MINE WATER DISCHARGE
  - UPSTREAM SAMPLING STATION
  - DOWNSTREAM SAMPLING STATION
  - DRIILLED WELL (LOG AVAILABLE)
  - DRIILLED WELL (NO LOG AVAILABLE)
  - DUG WELL
  - DEVELOPED SPRING
  - UNDEVELOPED SPRING
  - SOURCE OF PUBLIC WATER SUPPLY
  - MONITORING STATION
  - BACKGROUND SAMPLING STATION
  - ROADS OUTSIDE PERMIT AREA
  - POLLUTION CONTROL FACILITY

DRAINAGE BASIN CAPTINA CREEK  
 UNDERGROUND MINE WORKINGS LOCATION MAP NO 6-020  
 POST MINING LANDUSE - UNDEVELOPED



**CERTIFICATION**

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS MAP IS CORRECT, AND SHOWS TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL THE INFORMATION REQUIRED BY CHAPTER 1513 OF THE REVISED CODE AND RULES ADOPTED THEREUNDER.

ACKNOWLEDGED BEFORE ME, A NOTARY PUBLIC, THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ IN THE YEAR \_\_\_\_\_

**THE NACCO MINING COMPANY**

STATE ROUTE 7 • POWHATAN POINT • OHIO • 43942  
**POWHATAN MINE NUMBER 6**  
 BELMONT COUNTY T-6-N R-4-W SECTIONS 19  
 SCALE 1" = 100' CONTOUR INTERVAL 10' DATE JAN 85  
 SHEET 1 OF 7

**AIRSHAFT NO. 4**  
 MAP NUMBER 6-OIB-4

VALID EXISTING RIGHTS

PAK  
NOTAR  
YON  
BUNGAR  
TUKAL  
ERIN

Know All Men By These Presents: That We Nathaniel Piper and Elizabeth L. Piper (his wife) of the Township of Smith, County of Belmont and State of Ohio, in consideration of the sum of Six Hundred and Thirty One and 57/100 Dollars to us paid by J. W. Carroll (Grantor) of the State of Ohio, the receipt whereof is heroby acknowledged, do heroby Grant, Bargain, Sell and Convey to the said J. W. Carroll his heirs and assigns forever, the following No. 8 seam of coal (only), situated in the County of Belmont in the State of Ohio, and in the Township of Smith and described as follows: or Known as The Six foot Pittsburgh vein of coal or The No. 8 seam of coal; in and underlying the following described lands: Known as part of the South E. Quarter of Section Nineteen (19), Tp. No. 6, Range No. 4, Smith Tp., Belmont Co., Ohio. Beginning for the same at a stake in a ravine 152.04 rods West of the South East corner of said section from which a Hickory Sixteen inches in diameter bears N. 3° E. 26 links and a White Oak tree Twenty four inches diameter bears S. 14° W. 14 links running thence N. 8° E. 79 Poles to the middle of the road leading from Centerville to Armstrongs Mills Ohio; thence N. 11° E. 83 88/100 Poles to the North boundary of said quarter; thence along said boundary S. 87° E. 51.50 Poles to a small old tree; thence S. 2 1/2° W. 160.96 poles to the Township line and thence along said line N. 87° 2/3 W. 71.62 Poles to place of beginning, containing 63 Acres and 22 Perches of land.

Together with the free and uninterrupted right of way into, upon and under said above described lands at such points and in such manner as may be proper and necessary for the purpose of mining and digging and carrying away said coal heroby waiving all damages arising therefrom: or from the removal of all of said coal; together with the privilege of mining and removing through said described land other coal belonging to said grantor his heirs or assigns or which may hereafter be acquired.

Said Grantors, their heirs or assigns reserve the right to lease for oil, gas coal and other minerals.

To Have and to Hold said No. 8 seam of coal, with all the privileges and appurtenances therunto belonging, to the said J. W. Carroll his heirs and assigns forever. And the said Nathaniel Piper and Elizabeth L. Piper (his wife) for themselves and their heirs, do heroby covenant with the said J. W. Carroll his heirs and assigns, that we were lawfully seized of the said coal premises aforesaid; that the said coal premises are Free and Clear from all Incumbrances whatsoever; and that we will forever Warrant and Defend the same, with the appurtenances, unto the said J. W. Carroll grantee his heirs and assigns, against the lawful claims of all persons whatsoever.

In Witness Whereof, The said Elizabeth L. Piper (his wife) who heroby release her right of dower in the No. 8 seam of coal, has herunto set her hand, this 12<sup>th</sup> day of May in the year of our Lord one thousand nine hundred and five (1905)

Signed and acknowledged in presence of

Nathaniel Piper.

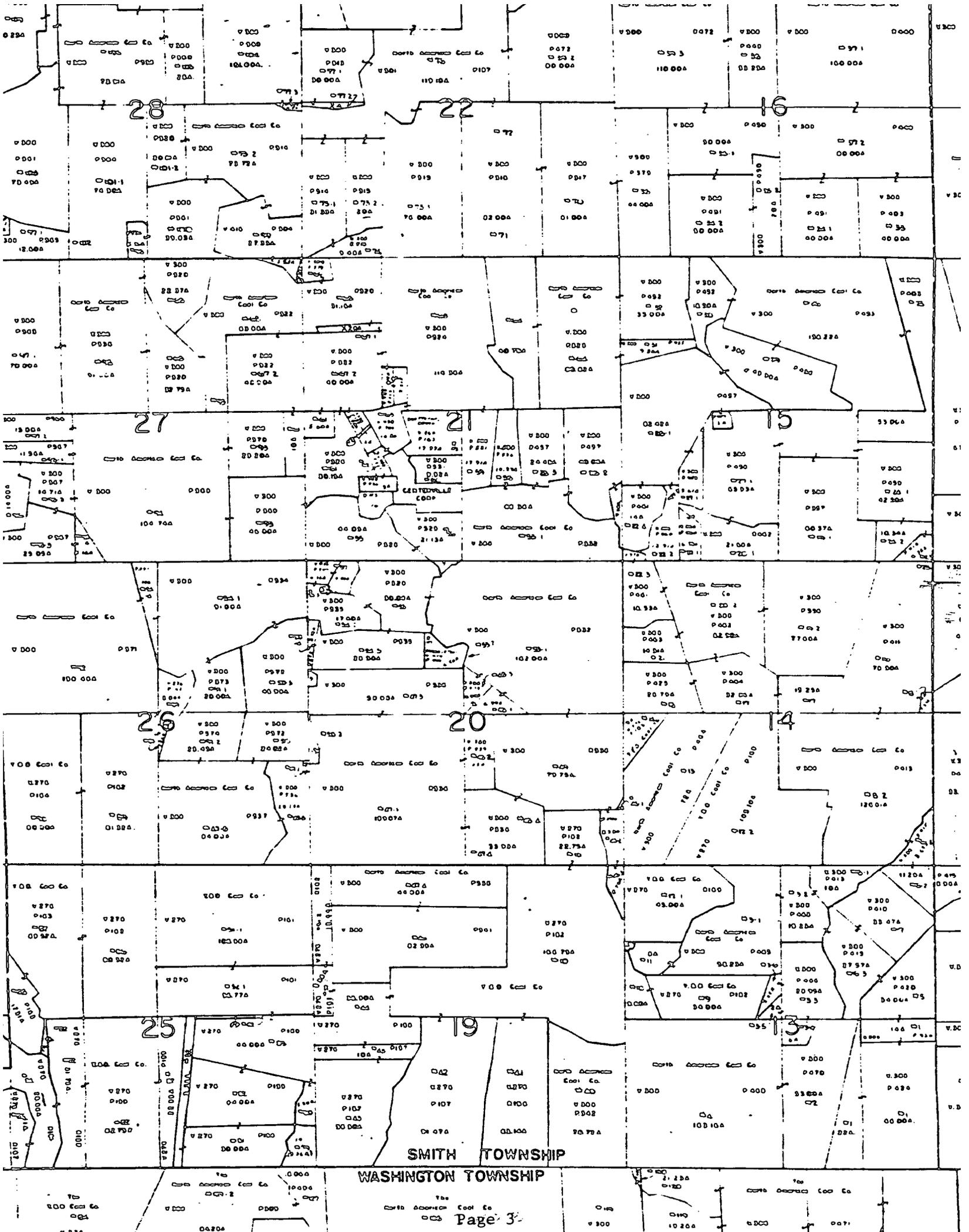
Abner Wilkinson.

Elizabeth L. Piper.

S. C. Piper.

The State of Ohio, Belmont County, SS.

Be it Remembered, That on this 12th day of May, A. D. 1905, before me, the subscriber, a Notary Public in and for said county, personally came the above-named Nathaniel



SMITH TOWNSHIP

WASHINGTON TOWNSHIP

mined from the lands of other parties."

"Said Grantor reserves the right to operate and drill for oil and gas, including the right to penetrate said coal for said purpose, the same to be done without unnecessary damage to the mining operations of said Grantor."

Being the same premises described as Tract 234 A conveyed to the Grantor herein by Rail and River Coal Company, by deed dated November 30, 1951, and recorded in Volume 388, Page 342, Belmont County Deed Records.

TRACT 41

Situated in the Township of Smith, County of Belmont and State of Ohio, and being a part of Section 19, Township 6, Range 4, beginning for the same at a stake in a ravine, 2508.66 feet West of the Southeast corner of said section, from which a Hickory tree 16 inches in diameter bears N. 3° E. 17.16 feet and a White Oak tree 24 inches in diameter bears S. 14° W., 9.24 feet; thence N. 8° E., 1303.50 feet to the middle of the road leading from Cantonville to Armstrong Mills; thence N. 11° E., 1384.02 feet to the North boundary line of said quarter; thence along said boundary line S. 87° E., 834.70 feet to a small Elm; thence S. 2° 30' W., 2655.84 feet to the Township line; thence along said line N. 87° 40' W., 1181.73 feet to the place of beginning, containing 63.138 acres.

Together with the free and uninterrupted right of way into, upon and under said above described lands at such points and in such manner as may be proper and necessary for the purpose of mining and digging and carrying away said coal hereby waiving all damages arising therefrom; or from the removal of all of said coal; together with the privilege of mining and removing through said described lands other coal belonging to said Grantor, his heirs and assigns, or which may hereafter be acquired. Said Grantor, their heirs or assigns, reserve the right to locate for oil, gas, coal and other minerals.

Being the same premises described as Parcel 2 conveyed to Grantor herein by the Youghiogheny and Ohio Coal Company, by deed dated November 10, 1969 and recorded in Volume 514, Page 367, Belmont County Deed Records.

TRACT 42

Situated in the Township of Smith, County of Belmont and State of Ohio, and being parts of the Southeast and Southwest quarters of Section 19, Township 6, Range 4, beginning for the same at a stake in a ravine at the Southwest corner of the land owned by Nathaniel Piper (being tract 41 above described), from which a Hickory tree 16 inches in diameter bears N. 3° E., 17.16 feet and a White Oak tree 24 inches in diameter bears S. 14° W., 9.24 feet; thence West 1846.35 feet with the section line; thence N. 33° 15' E., 429 feet; thence North, 188.925 feet; thence N. 24° 45' E., 148.50 feet; thence N. 6° 30' W., 120.45 feet; thence N. 6° 30' E., 231 feet; thence N. 6° 45' E., 355.575 feet; thence N. 43° 30' E., 85.80 feet; thence N. 43° 15' E., 169.95 feet; thence N. 27° E., 219.45 feet; thence N. 35° E., 160.875 feet; thence N. 30° 30' E., 133.65 feet; thence N. 29° 15' E., 116.325 feet; thence N. 13° 15' E., 70.95 feet; thence North 466.125 feet to the East and West division line of said section; thence East with said line, 1322.475 feet; thence S. 11° W., 1384.02 feet to the middle of the road leading from Armstrong's Mills to Cantonville; thence S. 6° E., 1303.50 feet to the place of beginning, containing 91.47 acres.

Together with the free and uninterrupted right of way into, upon and under said lands, at such points and in such manner as may be necessary and proper for the purpose of digging, mining and carrying away

## VALID EXISTING RIGHTS

The Nacco Mining Company was created as a wholly owned subsidiary of The North American Coal Corporation in 1969. Property rights of Nacco were obtained through the conveyances, fee purchases and lease acquisitions sited in Part I, Item C(1) of this Coal Mining and Reclamation Permit Application.

These property acquisitions establish Nacco's right to remove all of the coal in the Pittsburgh Number 8 seam within the reserves area of the Powhatan No. 6 Mine. Also acquired were surface tracts within Washington Township of Belmont County where the support facilities for this mine have been constructed. These surface tracts were acquired within these locations with the intent of situating all preparation plant and transport facilities that would be necessary to fully implement the coal production system planned for this mine site.

On April 16, 1969 Nacco entered into a Coal Sales Agreement with The Cleveland Electric Illuminating Company. This agreement outlines the financial commitments of the loan participants as well as the coal production systems of Nacco necessary for the development of the project.

Actual production of coal tonnages can be verified by Mining Informational Services Keystone Coal Industry Manual. An abbreviated copy of the 1972 edition of this report is included in Appendix IV. The manual documents that a total of 665,058 tons of coal were produced at the Powhatan No. 6 Mine of Nacco Mining Company during that year.

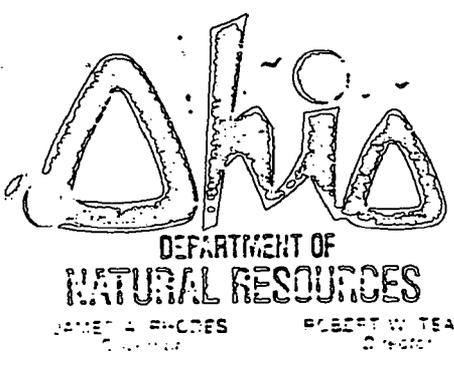
On January 4, 1977, the United States Department of Interior, Mining Enforcement and Safety Administration contacted the Powhatan No. 6 Mine to acknowledge the approval of the dust control plan which had been submitted by Nacco earlier that year. Similarly, on December 12, 1975, the same governmental agency again contacted Nacco approving the dust control plan submitted for this mine.

On July 25, 1972, the Belmont County, Ohio Health Department approved the Detail Plans of Coal Washing Plant for The Nacco Mining Company. In addition, on March 21, 1975, The Ohio Environmental Protection Agency notified The Nacco Mining Company that a public hearing was to be held concerning NPDES Permit No. L046\*AD. This permit was issued and effective on June 30, 1975. Copies of these documents are contained in Appendix IV.

A significant requirement for approval by MESA is that the plan, as outlined, must be implemented and demonstrate that the control methods specified by the plan cause the facility to meet or exceed all limitations as required by MESA. The dust control plan has been in full force and effect continuously since its initial approval in 1975.

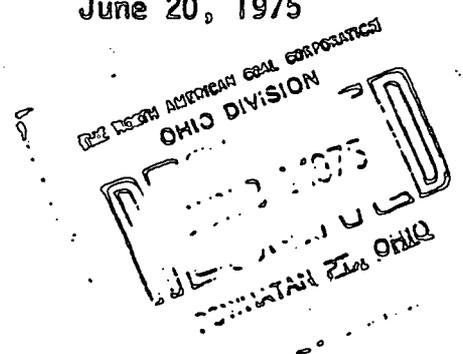
These documents all serve to establish that The Nacco Mining Company has a valid existing right to occupy lands now affected by the mining activities and support facilities of Powhatan No. 6 Mine as it applies to the mining prohibitions in Section 1501:13-3-03 of The Ohio Administrative Code.

Copies: L. VA-6  
J. Christenson



Return original to HSL  
Division of Water  
1500 DUBLIN ROAD • COLUMBUS, OHIO 43215 (614) 466-2626

June 20, 1975



CERTIFIED MAIL

Mr. Harvey S. Lewis, P.E.  
The Nacco Mining Company  
Powhatan Point, Ohio 43942

Permit No. 75-87  
Nacco Slurry Impoundment  
Southwest Quarter, Section 29  
Washington Township, Belmont County

Dear Mr. Lewis:

Enclosed herewith is Permit No. 75-87 issued under Sections 1521.06 and 1521.061 of the Revised Code of Ohio for the construction of this dam. Because of your anticipated construction schedule, the permit is issued for a period of 3 years. One copy each of the approved plans, specifications, and other supporting documents is enclosed.

The \$100.00 statutory fee and the performance bond in the amount of \$300,000.00 were received on April 10, 1975. The \$100.00 fee has been subsequently deposited with the Treasurer of State.

You have indicated in a letter dated June 17, 1975, that you and Mr. Walter M. Lorence of GeoMechanics, Inc., as registered professional engineers, will accept joint responsibility for inspection of this project during construction. Provisions of Chapters NRd-15 and NRd-17 of our Administrative Rules should be followed in completing the construction and having it approved.

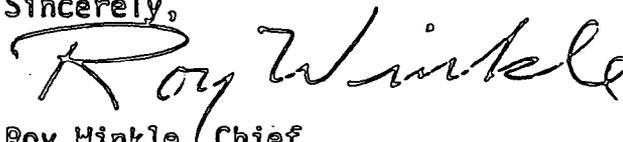
Please note all conditions of this permit. Condition 1 is self-explanatory. Condition 2 requires that my office be notified when certain specific construction activities are to be underway. Prompt notification will enable my staff to schedule their site visits accordingly. Inspection by this office of each of these items will facilitate our approval of the construction, but will not in any way relieve you and Mr. Lorence of your inspection responsibilities. Condition 3 requires that the final design for the emergency spillway be submitted and approved before construction of the embankment is completed.

Revised drawings numbered 7374-47, 7374-48, and 7374-49 for a 30-inch spillway pipe were received June 19, 1975 from Mr. Lorence. These sheets have been included in the approved copies of the final plans and are part of the permit.

June 20, 1975

If you have any questions concerning the permit and/or the Division of Water Administrative Rules feel free to contact George Mills, Bruce Pickens or me.

Sincerely,



Roy Winkle, Chief  
Division of Water  
(Dam Permits and Inspection)

RW:pr

encl.

cc: Walter M. Lorence, P.E.  
Steve Hamlin, OEPA, Southeast District  
John T. Davidson, Deputy Director, DNR  
Bruce E. Cryder, Assistant Attorney General

## PERMIT TO CONSTRUCT A DAM, DIKE, OR LEVEE

In accordance with and subject to the provisions, conditions and limitations of Chapter 1521 of the Revised Code of Ohio and the applicable rules and regulations adopted pursuant thereto, a permit is hereby issued to

The Nacco Mining Company

of Powhatan Point, Ohio 43942

on the 20 day of June, 19 75, to construct a dam  
(dam, dike, or levee)

on ~~the~~ a tributary of Captina Creek, located in Belmont  
(name of stream)

County, Washington Township, Southwest Quarter ~~Section~~, Section

~~or~~ 29, 3 miles W from Armstrongs Mills  
(direction) (town, post office, road intersection)

The approved plans and specifications including the conditions noted below, and bearing this permit number, 75-87, are hereby made a part of this permit. This permit is valid for a period of 3 years from date of issuance unless modified or revoked by the Chief.

## Conditions of this permit:

1. Reports of inspection during construction shall be submitted bi-weekly and shall include copies of the inspectors daily logs and a summary of all field and laboratory tests conducted for quality control of earthwork and concrete construction for the reporting period.
2. The Chief shall be notified when the following stages of construction are to be underway
  - A. Excavation of the cut-off trench; and,
  - B. Placement of the spillway pipe and construction of the pipe encasement.
3. Detailed plans for the emergency spillway shall be submitted and approved before construction of the embankment is completed.

Date June 20, 1975

Roy Winkle  
(Chief, Division of Water)

Re: Belmont County  
Washington Township  
Application for a Proposed Slurry Pond for Treatment of Thickener  
Underflow at MACCO Mine No. 6  
Received June 4, 1975  
From Mr. Carl E. Bishop, Quality and Environmental Control Engineer

James A. Rhodes  
Governor  
E. Williams, P.E.  
Director

October 8, 1975

CERTIFIED MAIL  
OhioEPA

The MACCO Mining Company  
Powhatan Point  
Ohio 43942



Gentlemen:

Enclosed is the Ohio EPA Permit To Install which will allow you to install the described source in the manner indicated in the permit. Because this permit contains several conditions and restrictions, I urge you to read it carefully.

As indicated on the permit, you are required to pay a permit fee as provided for in Ohio EPA regulation EP-39-02. The exact amount of this fee is indicated on page 1 of the Permit To Install. This amount must be remitted within fifteen (15) days of the effective date of the Permit To Install. Checks should be made payable to: Treasurer, State of Ohio and sent to Ohio EPA, New Source Permit Records Section, 361 East Broad Street, Columbus, Ohio 43215.

Under Ohio Revised Code, Chapters 119 and 6111, this permit will take effect on the date indicated unless you or an objector requests an adjudication hearing within thirty (30) days of the date of issuance, as provided for by Ohio Environmental Protection Agency regulation EP-40-13. At an adjudication hearing you may appear in person, or be represented by your attorney, or by such other representative as is permitted to practice before this agency, or you may present your position, arguments, or contentions in writing. At the hearing you may present evidence and examine witnesses appearing for and against you. Requests for hearing shall be in writing and shall specify the issues of fact and law to be contested. Requests for hearing should be sent to the Hearing Clerk, Box 1049, 361 East Broad Street, Columbus, Ohio 43215.

The agency may withdraw this permit at any time before it takes effect.

The NACCO Mining Company  
October 8, 1975  
Page 2

If you have any questions, please contact the Ohio EPA District Office or local air pollution control agency to whom you submitted your application.

Very truly yours,

*Jacqueline J. Nusbaum*

Jacqueline J. Nusbaum, Chief  
New Source Permit Records Section

Copy to Belmont County Health Department  
" " Southeast District Office, Public Wastewater

## OHIO ENVIRONMENTAL PROTECTION AGENCY

## Permit To Install

Application No. 06-150

Applicants Name: The NACCO Mining Company

Permit Fee: \$250.00

## Address:

City: Powhatan Point State: Ohio

Telephone: (614) 795-5500

Description of Proposed Source: A Proposed Slurry Pond for Treatment of  
Thickener Underflow at NACCO Mine No. 6

Issuance Date: October 8, 1975

Effective Date: November 24, 1975

The above named entity is hereby granted a permit to install for the above described source pursuant to Chapter EP-30 of the regulations of the Ohio Environmental Protection Agency. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described source of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described source of pollutants will be granted the necessary operating permits. This permit is granted subject to the following conditions attached hereto:

Ohio Environmental Protection Agency



by Ned E. Williams, P.E.  
Director  
361 East Broad Street  
Columbus, Ohio 43215



United States Department of the Interior

MINING ENFORCEMENT AND SAFETY ADMINISTRATION

901 BUSSERON STREET  
VINCENNES, INDIANA 47591

January 19, 1977

Mr. James Brockwell, Jr., Assistant Chief Engineer  
The Nacco Mining Company  
Powhatan Point, Ohio 43942.

Dear Mr. Brockwell:

On the basis of the information submitted, the engineering plan for the design and construction of impoundment structure, I.D. No. 1211 OHB 0025-03, at Powhatan No. 6 mine, has been approved.

Section 77.216-2(b) requires that any changes or modifications to this plan be approved by the District Manager prior to the initiation of such changes or modifications.

Sincerely yours,

Acting District Manager  
Coal Mine Health and Safety  
District 8

cc: D. Ward

M. Gregory

W. Smigill

RECEIVED

JAN 20 1977

North American Coal Corporation

Engineering Department

VINCENNES, INDIANA





December 19, 1980

Mr. David P. Davis, Chief Environmental Engineer  
The NACCO Mining Company  
Powhatan Point, OH 43942

Dear Mr. Davis:

A review has been made of the modification dated August 20, 1980, with supplemental information dated October 8, 1980, for No. 6 Mine, No. 2 Slurry Impoundment, I.D. No. 1211 OH8 0025-03. Based on the information submitted, the modification is approved and is now a part of the approved engineering plan for design, construction and maintenance of this impoundment.

The modification is to permit raising the crest elevation to 1065, raising the primary spillway to 1050, and adding an 80-foot wide open channel emergency spillway at elevation 1060.

If you have any questions concerning this matter, please advise.

Sincerely,

A handwritten signature in cursive script, appearing to read "M. Childers".

District Manager  
Coal Mine Safety and Health  
District 8

File E.D. C.2.3.3



October 6, 1981

Mr. William Elmer Schanck  
Chief Environmental Engineer  
The NACCO Mining Company  
Powhatan Point, OH 43942

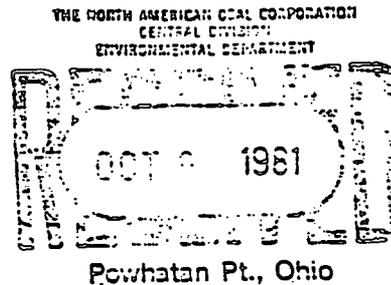
Dear Mr. Schanck:

A review has been completed of the modification to the engineering plan for design, construction and maintenance of Powhatan No. 6 mine, No. 2 Slurry Pond, I.D. No. 1211 OHS 0025-03. The modification dated June 30, 1981, requests to change to an eight standpipe piezometer monitoring system from the present 16 pneumatic piezometer monitoring system. Based on the information submitted, the modification is approved and is now part of the approved engineering plan.

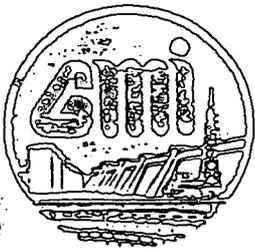
Section 77.216-2(b) requires that any changes or modifications to this plan be approved by the District Manager prior to the initiation of such changes or modifications.

Sincerely,

Acting District Manager  
Coal Mine Safety and Health  
District 8



FILE: ED-6.2.3.4.



# GeoMechanics, inc

1580 Broad Ave. Belle Vernon, Pa. 15012 (412) 929-3341/462-8939

March 9, 1982

The NACCO Mining Company  
Powhatan Point, Ohio 43942

ATTENTION: Mr. Wm. Elmer Schanck,  
Chief Environmental Engineer

Re: Engineer's Certification  
No. 2 Slurry Dam  
NACCO Mine No. 6  
M.S.H.A. I.D. No. 12N-OH8-0025-03  
G.M.I. Project No. SP-NAC-82

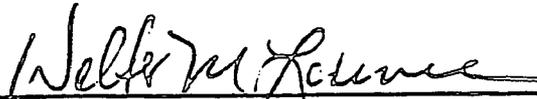
Gentlemen:

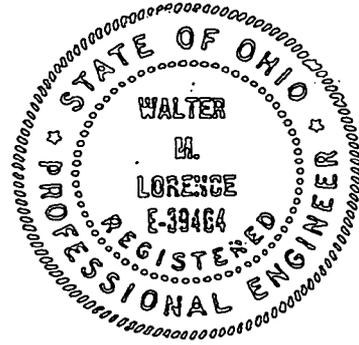
Our office is in receipt of the "As-Built Plans" for the above facility dated March 4, 1982. Based on our review of these plans in conjunction with our field observations and pursuant to the provisions of 30 CFR 77.216-4 (U.S. Department of Labor, Mine Safety and Health Administration), GeoMechanics, Inc. hereby certifies that, to the best of our knowledge, the construction of the slurry dam, to date, has been completed in conformance with the approved plans and specifications.

We wish to extend our appreciation for this opportunity to once again be of service to you. Should you have any questions or require additional information, please contact us.

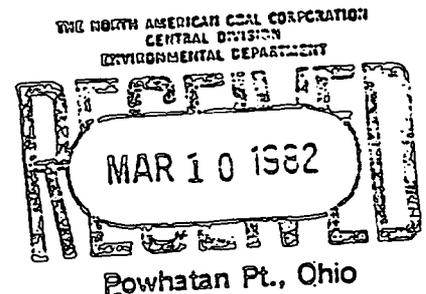
Very truly yours,

GEO-MECHANICS, INC.

  
WALTER M. LORENCE, P.E.  
VICE PRESIDENT



WML:njr



File: ED - 6.2.3.9

hty. Included soils make up about 10 percent of areas.

meability is moderately rapid in the subsoil and in the substratum of this Chili soil. Surface runoff is or medium. The available water capacity is rate. The shrink-swell potential is low. Potential action is moderate. Unless the soil has been limed, on in the root zone is medium acid to very strongly

Chili soil, the open part of the map unit, is used lawns and gardens. The potential is high for lawns, ornamental and flower gardens, shrubs, trees, building site development, and recreation uses.

Chili soil is suited to lawns, vegetable and flower gardens, shrubs, and trees. It warms and dries early in spring and is well suited to early gardening. The soil is droughty during dry periods but is well suited to irrigation. Incorporating plant residue into the surface layer increases the organic matter content and the available water capacity. The included spots of cut and fill land are not well suited to lawns and gardens because the underlying subsoil material has very poor tilth.

Chili soil is well suited as a site for buildings, septic tank absorption fields, and extensive recreation areas. The gravel in the surface layer interferes with such extensive recreation uses as ball diamonds. Sloughing is a hazard in excavations. Local roads can be improved by incorporating the surface layer and subsoil with a suitable base material.

The capability subclass is 1Ie for the Chili soil. No woodland suitability subclass is assigned for the Chili soil. No capability subclass or woodland suitability subclass is assigned for Urban land.

**1B—Culleoka silt loam, 3 to 8 percent slopes.** This is a moderately deep, gently sloping, well drained soil primarily on ridgetops. A few areas are on the crests of knolls. Most areas are smooth and slightly convex and range from 3 to 60 acres.

Typically, the surface layer is brown, friable silt loam about 8 inches thick. The brown, friable subsoil is about 17 inches thick. It is silt loam in the upper part and channery loam in the lower part. The substratum is yellowish brown, friable very channery loam. Fine grained sandstone bedrock is at about 33 inches.

Included with this soil in mapping are small areas of deep Wellston and Westmoreland soils near the center of the wider ridgetops. Severely eroded soils that are shallow over bedrock are included near slope breaks and narrow ridge crests. Those soils have a channery silt loam surface layer. Also included are areas underlain by sandstone bedrock. Included soils make up about 20 percent of most areas.

Permeability is moderate or moderately rapid in this Culleoka soil, and the available water capacity is low. Surface runoff is medium in cultivated areas. A few hard sandstone and sandstone fragments are in the surface layer, and the content of fragments increases with

increasing depth in the subsoil. The shrink-swell potential is low. Potential frost action is moderate. The root zone is moderately deep over sandstone bedrock. In unlimed areas, reaction in the root zone is medium acid or strongly acid in the topsoil and subsoil and strongly acid to slightly acid in the substratum.

Most of the acreage is farmed. A small acreage is wooded. The potential is medium for cultivated crops, hay, pasture, and building site development, low to medium for sanitary facilities, and high for trees.

This soil is suited to corn and small grain and to grasses and legumes for hay, but it is droughty. In cultivated areas, the hazard of erosion is moderate. Deep-rooted legumes are difficult to maintain in many areas. Controlling erosion, maintaining tilth and organic matter content and conserving moisture are concerns of management. Conservation tillage, which leaves crop residue on the surface; grasses and legumes; incorporating crop residue into the plow layer; and cover crops, contour tillage, and strip cropping reduce the hazard of erosion. Tilling within the optimum range of moisture content helps to prevent soil compaction.

This soil is suited to pasture. Reseeding with cover crops or companion crops or by trash mulch or no-till seeding reduces the hazard of erosion. Proper stocking, pasture rotation, mowing to control weeds, and timely application of lime and fertilizer are needed to maintain a good stand of key forage plants. Limiting grazing in winter and other wet periods helps to prevent soil compaction.

This soil is suited to trees. Mechanical planting and mowing to reduce plant competition are possible. Species selected for planting should be somewhat tolerant of droughtiness.

This soil is suitable as a site for buildings without basements. Depth to bedrock is a limitation for houses with basements. Depth to bedrock and the possible contamination of ground water are severe limitations for sanitary facilities. Local roads can be improved by using a suitable base material.

The capability subclass is 1Ie. The woodland suitability subclass is 2o.

**CuC—Culleoka silt loam, 8 to 15 percent slopes.** This is a moderately deep, strongly sloping, well drained soil on narrow ridgetops and on the crests of knolls. Slopes are smooth with a few shallow drainageways near the edge of some ridgetops. Areas range from 3 to 60 acres.

Typically, the surface layer is brown, friable silt loam about 8 inches thick. The brown, friable subsoil is about 17 inches thick. It is silt loam in the upper part and channery loam in the lower part. The substratum is yellowish brown, friable very channery loam. Fine grained sandstone bedrock is at about 33 inches.

Included with this soil in mapping are small areas of the deep Wellston and Westmoreland soils, commonly near the center of wide ridgetops. A few narrow bands of

**WmD—Westmoreland silt loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is mainly in bands around hillsides. A few small areas are on ridgetops and on knolls on ridgetops. Slopes are mainly smooth. Most areas range from about 10 to 40 acres.

Typically, the surface layer is brown, friable silt loam about 8 inches thick. The subsoil is about 27 inches thick. The upper and middle parts are brown and yellowish brown, friable silt loam and firm clay loam, and the lower part is yellowish brown, firm channery clay loam. The substratum is yellowish brown, firm channery clay loam. Hard sandstone bedrock is at about 50 inches.

Included with this soil in mapping are small areas of moderately deep Dekalb soils on the crests of ridges and knolls or near slope breaks. The deeper Richland soils are included in coves or on the lower part of hillsides. Included soils make up 10 to 20 percent of most areas.

Permeability and available water capacity are moderate in this Westmoreland soil. The root zone is deep. Runoff is very rapid in cultivated areas. The potential frost action is moderate. The shrink-swell potential is low. In unlimed areas, reaction in the root zone is medium acid to very strongly acid.

This soil is used mostly for crops and pasture. The potential is medium for cultivated crops and small grain, high for hay, pasture, and trees, and low for building site development and sanitary facilities.

This soil is suited to small grain, grasses and legumes for hay, and to an occasional cultivated crop. A commonly used rotation includes a cultivated crop about 1 in every 4 years. In cultivated areas, the hazard of erosion is very severe. Controlling erosion and maintaining organic matter content are concerns of management. No till or conservation tillage, which leaves crop residue on the surface, incorporating crop residue into the plow layer, grasses and legumes in the cropping system, contour strip cropping, cover crops, diversions, and grassed waterways reduce the hazard of erosion. Deep-rooted legumes are difficult to maintain in many areas.

This soil is suited to pasture. If it is overgrazed or plowed for seedbed preparation, the hazard of erosion is very severe. Reseeding by trash mulch or no-till seeding or with cover crops or companion crops reduces the hazard of erosion. Proper stocking, pasture rotation, mowing to control weeds, and timely application of lime and fertilizer are needed to maintain pasture and soil in good condition. Limiting grazing in winter and other wet periods helps to prevent soil compaction.

This soil is suited to trees and woodland wildlife habitat. Locating skid trails and logging roads on the contour reduces erosion. The slope somewhat limits the use of equipment, but mechanical planting and mowing to reduce plant competition are possible. Coves and north- and east-facing slopes are the best sites for

woodland. These sites have cooler temperatures and have more water available because they have less exposure to the prevailing winds and the sun.

The moderately steep slope and depth to bedrock severely limit the use of this soil as a site for buildings and sanitary facilities. As much cover as possible should be maintained on the site during construction to reduce erosion. Trails in recreation areas should be protected against erosion and should be laid out on the contour if possible.

The capability subclass is IVe. The woodland suitability subclass is 2r.

**WmE—Westmoreland silt loam, 25 to 40 percent slopes.** This deep, well drained, steep soil is on hillsides. Slopes are generally smooth. Irregularities occur along a few drainageways. Most areas range from 10 to 50 acres.

Typically, the surface layer is brown, friable silt loam about 6 inches thick. The subsoil is about 24 inches thick. The upper and middle parts are brown and yellowish brown, friable silt loam and firm clay loam, and the lower part is yellowish brown, firm channery clay loam. The substratum is yellowish brown, firm channery clay loam. Hard sandstone bedrock is at a depth of about 46 inches.

Included with this soil in mapping are small areas of the coarser textured, moderately deep Dekalb soils near slope breaks and the deeper Richland soils on concave slopes and the lower part of hillsides. Included soils make up about 20 percent of most areas.

Permeability is moderate in the Westmoreland soil, and runoff is very rapid. The root zone is deep. The available water capacity is moderate. Potential frost action is moderate. The shrink-swell potential is low. In unlimed areas, reaction in the root zone is very strongly acid to medium acid.

This soil is used mostly for pasture and woodland. The potential is high for trees and woodland wildlife habitat and is medium for hay and pasture. It is low for cultivated crops, small grain, sanitary facilities, and building site development.

Even though the steep slope limits the use of some equipment, this soil is suited to pasture. Smooth slopes are suited to hay. If the soil is overgrazed or plowed for seedbed preparation, erosion is a very severe hazard. Reseeding with a companion crop or using the trash mulch or no-till seeding reduces erosion. Proper stocking, pasture rotation, mowing for weed control, and timely application of lime and fertilizer are needed to maintain a good stand of key forage plants. Limiting grazing in winter and other wet periods helps to prevent soil compaction. Deep-rooted legumes are difficult to maintain in many areas.

This soil is suited to trees and woodland wildlife habitat. Locating skid trails and logging roads on the contour reduces erosion. The slope limits the use of planting and mowing equipment. Coves and north- and

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BuD <sup>2</sup> : Brookside-----  Urban land.	Severe: slope, slippage.	Severe: slope, shrink-swell, slippage.	Severe: slope, shrink-swell, slippage.	Severe: slope, shrink-swell, slippage.	Severe: slope, low strength, slippage.	Severe: slope.
Cg----- Chagrin	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
ChB----- Chili	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Moderate: frost action, low strength.	Moderate: small stones.
CmB <sup>2</sup> : Chili-----  Urban land.	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Moderate: frost action, low strength.	Moderate: small stones.
CuB----- Culleoka	Moderate: depth to rock.	Slight-----	Moderate: depth to rock.	Moderate: slope.	Moderate: low strength, frost action.	Moderate: thin layer.
CuC----- Culleoka	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope, thin layer.
DkB----- Dekalb	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Moderate: thin layer, droughty.
DkC----- Dekalb	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.	Moderate: slope, thin layer, droughty.
DkD, DkE----- Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
DmF----- Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Dp <sup>2</sup> , Ds <sup>2</sup> . Dumps						
DuB <sup>2</sup> : Duncannon-----  Urban land.	Slight-----	Slight-----	Slight-----	Moderate: slope.	Severe: frost action.	Slight.
EbB----- Elba	Moderate: too clayey, depth to rock.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
EbC----- Elba	Moderate: slope, too clayey, depth to rock.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: slope, shrink-swell.	Severe: low strength, shrink-swell.	Moderate: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EbD, EbE----- Elba	Severe: slope, slippage.	Severe: slope, shrink-swell, slippage.	Severe: slope, shrink-swell, slippage.	Severe: slope, shrink-swell, slippage.	Severe: low strength, slope, slippage.	Severe: slope.
ElB----- Elkinsville	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
ElC----- Elkinsville	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
ElD----- Elkinsville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
FbB----- Fairpoint	Moderate: large stones.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Severe: small stones, droughty.
FbD----- Fairpoint	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage, low strength.	Severe: small stones, slope.
FcB----- Fairpoint	Moderate: large stones.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: droughty.
FcD----- Fairpoint	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, low strength, slippage.	Severe: slope.
FtA----- Fitchville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action, wetness.	Moderate: wetness.
He----- Hartshorn	Severe: cutbanks cave, floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
LeB----- Lowell	Moderate: too clayey, depth to rock.	Moderate: shrink-swell.	Moderate: wetness, depth to rock.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.
LeC----- Lowell	Moderate: too clayey, slope, depth to rock.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
LeD----- Lowell	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
LeE, LeF----- Lowell	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: low strength, slope, slippage.	Severe: slope.
LoB*----- Lowell	Moderate: too clayey, depth to rock.	Moderate: shrink-swell.	Moderate: wetness, depth to rock.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BuB <sup>2</sup> : Brookside-----  Urban land.	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey.
BuD <sup>2</sup> : Brookside-----  Urban land.	Severe: slope, percs slowly, slippage.	Severe: slope.	Severe: slope, too clayey, slippage.	Severe: slope.	Poor: slope, too clayey.
Cg----- Chagrin	Severe: floods.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Good.
ChB----- Chili	Slight-----	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
CmB <sup>2</sup> : Chili-----  Urban land.	Slight-----	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
CuB----- Culleoka	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, thin layer.
CuC----- Culleoka	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, thin layer.
DkB----- Dekalb	Severe: depth to rock.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, area reclaim.
DkC----- Dekalb	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, area reclaim.
DkD, DkE, DmF----- Dekalb	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, area reclaim.
Dp <sup>2</sup> , Ds <sup>2</sup> . Dumps					
DuB <sup>2</sup> : Duncannon-----  Urban land.	Slight-----	Moderate: slope, seepage.	Slight-----	Slight-----	Good.
EbB----- Elba	Severe: percs slowly.	Moderate: slope, depth to rock.	Severe: too clayey, depth to rock.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
EbC----- Elba	Severe: percs slowly.	Severe: slope.	Severe: too clayey, depth to rock.	Moderate: slope, depth to rock.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
EbD, EbE----- Elba	Severe: slope, percs slowly, slippage.	Severe: slope.	Severe: slope, slippage, depth to rock.	Severe: slope.	Poor: slope, too clayey, hard to pack.
ElB----- Elkinsville	Slight-----	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
ElC----- Elkinsville	Moderate: slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
ElD----- Elkinsville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
FbB----- Fairpoint	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight-----	Poor: small stones.
FbD----- Fairpoint	Severe: percs slowly, slope, slippage.	Severe: slope.	Severe: slope, slippage.	Severe: slope.	Poor: small stones, slope.
FcB----- Fairpoint	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight-----	Poor: small stones.
FcD----- Fairpoint	Severe: percs slowly, slope, slippage.	Severe: slope.	Severe: slope, slippage.	Severe: slope.	Poor: small stones, slope.
FtA----- Fitchville	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
He----- Hartshorn	Severe: floods, depth to rock.	Severe: floods, seepage.	Severe: floods, seepage, depth to rock.	Severe: floods, seepage.	Poor: small stones, seepage.
LeB----- Lowell	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, too clayey.	Moderate: wetness, depth to rock.	Poor: too clayey.
LeC----- Lowell	Severe: wetness, percs slowly.	Severe: wetness, slope.	Severe: depth to rock, too clayey.	Moderate: wetness, slope, depth to rock.	Poor: too clayey.
LeD----- Lowell	Severe: wetness, percs slowly, slope.	Severe: wetness, slope.	Severe: depth to rock, too clayey, slope.	Severe: slope.	Poor: too clayey, slope.
LeE, LeF----- Lowell	Severe: percs slowly, slope, slippage.	Severe: slope.	Severe: depth to rock, slope, slippage.	Severe: slope.	Poor: too clayey, slope.
LoB <sup>a</sup> : Lowell-----	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, too clayey.	Moderate: wetness, depth to rock.	Poor: too clayey.
Westmoreland-----	Moderate: depth to rock.	Moderate: slope, seepage.	Severe: depth to rock.	Moderate: depth to rock.	Fair: thin layer, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BsC----- Brookside	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
BsD----- Brookside	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
BsE----- Brookside	Poor: slope, low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
BuB <sup>o</sup> : Brookside-----  Urban land.	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
BuD <sup>o</sup> : Brookside-----  Urban land.	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
Cg----- Chagrin	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
ChB----- Chili	Good-----	Fair: excess fines.	Good-----	Fair: small stones.
CmB <sup>o</sup> : Chili-----  Urban land.	Good-----	Fair: excess fines.	Good-----	Fair: small stones.
CuB, CuC Culleoka-----	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
DkB, DKC----- Dekalb	Poor: thin layer, area reclaim.	Poor: excess fines.	Poor: excess fines.	Fair: area reclaim, small stones, thin layer.
DkD----- Dekalb	Poor: thin layer, area reclaim.	Poor: excess fines.	Poor: excess fines.	Poor: slope.
DkE----- Dekalb	Poor: slope, thin layer, area reclaim.	Poor: excess fines.	Poor: excess fines.	Poor: slope.
DmF----- Dekalb	Poor: slope, thin layer, area reclaim.	Poor: excess fines.	Poor: excess fines.	Poor: slope, small stones.
Dp <sup>o</sup> , Ds <sup>o</sup> . Dumps				

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
DuB <sup>0</sup> : Duncannon----- Urban land.	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
EbB, EbC----- Elba	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
EbD----- Elba	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, slope.
EbE----- Elba	Poor: low strength, slope, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, slope.
ElB----- Elkinsville	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
ElC----- Elkinsville	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
ElD----- Elkinsville	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
FbB----- Fairpoint	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: small stones.
FbD----- Fairpoint	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: small stones, slope.
FcB----- Fairpoint	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: small stones.
FcD----- Fairpoint	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: small stones, slope.
FtA----- Fitchville	Poor: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
He----- Hartshorn	Fair: thin layer, area reclaim.	Poor: thin layer.	Poor: thin layer.	Poor: small stones.
LeB----- Lowell	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
LeC----- Lowell	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, too clayey.
LeD----- Lowell	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
LeE, LeF----- Lowell }	Poor: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
WmD----- Westmoreland	Fair: slope, low strength, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
WmE, WmF----- Westmoreland	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
WoC <sup>a</sup> : Westmoreland-----	Fair: low strength, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
Upshur-----	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey.
WoD <sup>a</sup> : Westmoreland-----	Fair: slope, low strength, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Upshur-----	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, thin layer, too clayey.
ZnB----- Zanesville	Fair: low strength, wetness, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
ZnC----- Zanesville	Fair: low strength, wetness, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, too clayey.

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth In	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
BsC, BsD, BsE----- Brookside	0-18	Silty clay loam	CL, ML, CL-ML	A-6, A-7	0-5	90-100	80-100	75-100	70-95	30-50	10-28
	18-55	Clay, silty clay loam, channery clay loam.	CH, CL	A-7, A-6	0-15	85-95	70-90	65-85	50-85	35-70	15-40
	55-80	Channery clay loam, clay, silty clay.	GC, CH, CL, SC	A-6, A-7	5-25	70-100	50-75	45-75	40-70	35-65	20-44
BuB*, BuD*: Brookside-----	0-18	Silty clay loam	CL, ML, CL-ML	A-6, A-7	0-5	90-100	80-100	75-100	70-95	30-50	10-28
	18-55	Clay, silty clay loam, channery silty clay loam.	CH, CL	A-7, A-6	0-15	85-95	70-90	65-85	50-85	35-70	15-40
	55-80	Channery clay loam, clay, silty clay.	GC, CH, CL, SC	A-6, A-7	5-25	70-100	50-75	45-75	40-70	35-65	20-44
Urban land.											
Cg----- Chagrin	0-9	Silt loam-----	ML, CL, CL-ML	A-4	0	95-100	90-100	80-100	70-90	20-35	2-10
	9-57	Silt loam, loam, sandy loam.	ML, SM	A-4	0	90-100	85-100	75-90	45-85	20-40	NP-10
	57-62	Stratified silt loam to fine sand.	ML, SM	A-4, A-2	0	85-100	80-100	55-85	30-80	20-40	NP-10
CnB----- Chili	0-9	Gravelly loam---	SM, ML, GM	A-4, A-2	0	65-90	60-85	35-80	15-60	<30	NP-7
	9-44	Loam, gravelly clay loam, gravelly loam.	ML, SM, SC, CL	A-4, A-2, A-6	0	65-100	50-80	35-70	20-65	<30	NP-12
	44-54	Very gravelly sandy loam, very gravelly loam, gravelly sandy loam.	SM, GM	A-1, A-2	0-5	45-80	35-75	25-55	15-35	---	NP
	54-60	Sand and gravel	GW, GM, SP, SM	A-1	5-10	30-60	25-55	10-30	2-15	---	NP
CmB*: Chili-----	0-9	Gravelly loam---	SM, ML, GM	A-4, A-2	0	65-90	60-85	35-80	15-60	<30	NP-7
	9-44	Loam, gravelly clay loam, gravelly loam.	ML, SM, SC, CL	A-4, A-2, A-6	0	65-100	50-80	35-70	20-65	<30	NP-12
	44-54	Very gravelly sandy loam, very gravelly loam, gravelly sandy loam.	SM, GM	A-1, A-2	0-5	45-80	35-75	25-55	15-35	---	NP
	54-60	Sand and gravel	GW, GM, SP, SM	A-1	5-10	30-60	25-55	10-30	2-15	---	NP
Urban land.											
CuB, CuC Culleoka-----	0-8	Silt loam-----	ML, CL, CL-ML	A-4	0-10	90-100	85-100	70-100	55-95	<35	NP-10
	8-25	Silt loam, channery loam, silty clay loam.	ML, CL, CL-ML	A-6, A-4	5-25	80-95	75-95	65-95	55-90	20-40	2-20
	25-33	Very flaggy silty clay loam, flaggy loam, very channery loam.	ML, CL, GC, SM	A-6, A-4, A-2	10-60	50-95	40-90	35-90	30-85	20-40	2-20
	33-35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct $\phi$	Percentage passing sieve number--				Liquid limit Pct	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
He----- Hartshorn	0-24	Silt loam-----	ML, SM, SC, CL	A-4	0-5	80-100	75-100	60-90	45-80	20-32	NP-10
	24-40	Stratified very gravelly sandy loam to very gravelly sand.	GM, SM, GP-GM, SP-SM	A-1, A-2	0-15	40-80	30-50	20-50	12-30	---	NP
	40-42	Weathered bedrock.	---	---	---	---	---	---	---	---	---
LeB, LeC, LeD, LeE, LeF----- Lowell	0-7	Silt loam-----	CL, ML, CL-ML	A-4, A-6	0	100	95-100	85-100	70-90	22-40	4-12
	7-18	Silty clay loam	CL	A-6, A-7	0-2	95-100	95-100	90-100	80-95	34-42	15-22
	18-42	Silty clay, clay	CH, CL	A-7, A-6	0-5	95-100	90-100	80-100	75-95	35-65	14-45
	42-50	Gravelly silty clay loam, shaly silty clay.	GC, CL	A-6, A-7	5-20	65-90	55-80	50-80	45-75	30-45	15-30
50-52	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	
LoB <sup>a</sup> , LoC <sup>a</sup> , LoD <sup>a</sup> , LoE <sup>a</sup> , LoF <sup>a</sup> , LpF <sup>a</sup> : Lowell-----	0-7	Silt loam-----	CL, ML, CL-ML	A-4, A-6	0	100	95-100	85-100	70-90	22-40	4-12
	7-18	Silty clay loam	CL	A-6, A-7	0-2	95-100	95-100	90-100	80-95	34-42	15-22
	18-42	Silty clay, clay	CH, CL	A-7, A-6	0-5	95-100	90-100	80-100	75-95	35-65	14-45
	42-50	Gravelly silty clay loam, shaly silty clay.	GC, CL	A-6, A-7	5-20	65-90	55-80	50-80	45-75	30-45	15-30
50-52	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	
Westmoreland-----	0-8	Silt loam-----	ML, CL	A-4, A-6	0	85-100	80-100	75-95	60-95	---	---
	8-28	Clay loam, channery loam, silt loam.	CL, ML, GM, GC	A-4, A-6, A-7, A-2	0-15	65-100	55-95	50-90	45-85	22-45	2-20
	28-50	Very channery loam, channery clay loam, very shaly silty clay loam.	GM, GC, SM, SC	A-2, A-1, A-4, A-6	0-20	25-95	20-95	15-90	15-80	20-40	2-20
	50-52	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MnB, MnD, MnE----- Morristown	0-8	Clay loam-----	CL	A-7, A-6	0-5	90-100	80-100	70-95	60-95	35-50	12-24
	8-60	Gravelly clay loam, gravelly loam, channery clay loam.	GM-GC, GC, CL, CL-ML	A-7, A-6, A-4, A-2	10-25	40-75	30-65	25-65	20-60	25-50	4-24
MoB, MoD, MoE----- Morristown	0-5	Gravelly clay loam.	CL, GC, SC	A-7, A-6	10-25	70-95	50-80	50-75	40-70	35-50	12-24
	5-60	Gravelly clay loam, gravelly loam, channery clay loam.	GC, CL, CL-ML, GM-GC	A-7, A-6, A-4, A-2	10-25	40-75	30-65	25-65	20-60	25-50	4-24
MoF----- Morristown	0-5	Very stony clay loam.	CL, GC, SC	A-7, A-6	15-40	70-95	50-80	50-75	40-70	35-50	12-24
	5-60	Very gravelly silty clay loam, cobbly loam, cobbly clay loam.	GC, CL, CL-ML, GM-GC	A-7, A-6, A-4, A-2	10-25	40-75	30-65	25-65	20-60	25-50	4-24

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density G/cm <sup>3</sup>	Permeability In/hr	Available water capacity In/in	Soil reaction pH	Shrink-swell potential	Erosion factors		Organic matter Pct
								K	T	
AeC-----	0-9	15-27	1.20-1.50	0.6-2.0	0.18-0.22	3.6-5.5	Low-----	0.32	5	1-3
Allegheny Variant	9-58	15-30	1.25-1.60	0.6-2.0	0.15-0.20	3.6-5.5	Low-----	0.32		
	58-70	15-30	1.25-1.55	0.6-2.0	0.08-0.17	3.6-5.5	Low-----	0.32		
As-----	0-9	10-25	1.30-1.45	0.6-2.0	0.16-0.23	5.6-7.3	Low-----	0.28	4	2-4
Ashton	9-43	18-34	1.40-1.60	0.6-2.0	0.18-0.23	5.6-7.3	Low-----	0.43		
	43-89	10-40	1.40-1.60	0.6-2.0	0.14-0.20	5.6-7.3	Low-----	0.43		
BaB, BaD-----	0-5	5-18	1.30-1.50	2.0-6.0	0.07-0.16	<3.6	Low-----	0.24	5	<.5
Barkcamp	5-60	6-18	1.25-1.50	2.0-20	0.03-0.11	<3.6	Low-----	0.20		
BaF-----	0-5	5-18	1.30-1.50	2.0-6.0	0.03-0.07	<3.6	Low-----	0.24	5	<.5
Barkcamp	5-60	6-18	1.25-1.50	2.0-20	0.03-0.11	<3.6	Low-----	0.10		
BcB, BcD-----	0-8	27-36	1.40-1.65	0.2-0.6	0.13-0.21	5.1-6.5	Low-----	0.32	5	.5-2
Barkcamp	8-60	6-18	1.25-1.50	2.0-20	0.03-0.11	<3.6	Low-----	0.20		
BeB, BeD-----	0-8	18-27	1.35-1.50	0.6-2.0	0.15-0.20	4.5-6.0	Low-----	0.43	5	.5-2
Bethesda	8-60	18-35	1.60-1.90	0.2-0.6	0.04-0.10	3.6-5.5	Low-----	0.32		
BhB, BhD, BhE----	0-5	27-35	1.45-1.65	0.2-0.6	0.05-0.16	3.6-5.5	Low-----	0.32	5	<.5
Bethesda	5-60	18-35	1.60-1.90	0.2-0.6	0.04-0.13	3.6-5.5	Low-----	0.32		
BhF-----	0-5	27-35	1.45-1.65	0.2-0.6	0.04-0.09	3.6-5.5	Low-----	0.32	5	<.5
Bethesda	5-60	18-35	1.60-1.90	0.2-0.6	0.04-0.13	3.6-5.5	Low-----	0.32		
BsC, BsD, BsE----	0-18	27-40	1.20-1.50	0.6-2.0	0.18-0.23	5.1-7.8	Moderate-----	0.37	5	1-3
Brookside	18-55	30-60	1.45-1.70	0.2-0.6	0.07-0.14	5.6-7.8	High-----	0.37		
	55-80	30-60	1.40-1.75	0.2-0.6	0.05-0.12	5.6-7.8	High-----	0.37		
BuB <sup>2</sup> , BuD <sup>2</sup> : Brookside-----	0-18	27-40	1.20-1.50	0.6-2.0	0.18-0.23	5.1-7.8	Moderate-----	0.37	5	1-3
	18-55	30-60	1.45-1.70	0.2-0.6	0.07-0.14	5.6-7.8	High-----	0.37		
	55-80	30-60	1.40-1.75	0.2-0.6	0.05-0.12	5.6-7.8	High-----	0.37		
Urban land.										
Cg-----	0-9	10-27	1.20-1.40	0.6-2.0	0.20-0.24	5.6-7.3	Low-----	0.32	5	2-4
Chagrin	9-57	18-30	1.20-1.50	0.6-2.0	0.14-0.20	5.6-7.3	Low-----	0.32		
	57-62	5-25	1.20-1.40	0.6-2.0	0.08-0.20	5.6-7.3	Low-----	0.32		
ChB-----	0-9	7-24	1.20-1.40	0.6-2.0	0.10-0.14	4.5-7.3	Low-----	0.24	4	1-3
Chili	9-44	18-27	1.20-1.60	2.0-6.0	0.09-0.16	5.1-6.5	Low-----	0.32		
	44-54	5-18	1.20-1.60	2.0-6.0	0.06-0.12	5.1-6.5	Low-----	0.17		
	54-60	1-10	---	6.0-20	0.02-0.08	5.1-7.8	Low-----	0.10		
CmB <sup>2</sup> : Chili-----	0-9	7-24	1.20-1.40	0.6-2.0	0.10-0.14	4.5-7.3	Low-----	0.24	4	1-3
	9-44	18-27	1.20-1.60	2.0-6.0	0.09-0.16	5.1-6.5	Low-----	0.32		
	44-54	5-18	1.20-1.60	2.0-6.0	0.06-0.12	5.1-6.5	Low-----	0.17		
	54-60	1-10	---	6.0-20	0.02-0.08	5.1-7.8	Low-----	0.10		
Urban land.										
CuB, CuC----- Culleoka	0-8	15-27	1.20-1.40	0.6-6.0	0.14-0.20	5.1-6.5	Low-----	0.32	3	1-4
	8-25	18-35	1.20-1.50	0.6-6.0	0.12-0.20	5.1-6.0	Low-----	0.28		
	25-33	18-35	1.20-1.50	0.6-6.0	0.05-0.14	5.1-6.5	Low-----	0.17		
	33-35	---	---	---	---	---	---	---		
DkB, DKC, DKD, DkE----- Dekalb	0-6	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-6.5	Low-----	0.24	3	2-4
	6-28	7-18	1.20-1.50	2.0-20	0.06-0.12	3.6-5.5	Low-----	0.17		
	28-30	---	---	---	---	---	---	---		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm <sup>3</sup>	In/hr	In/in	pH				Pct
DmF----- Dekalb	0-5	10-20	1.20-1.50	2.0-20	0.08-0.12	4.5-6.5	Low-----	0.24	3	2-4
	5-25	7-18	1.20-1.50	2.0-20	0.06-0.12	4.5-5.5	Low-----	0.17		
	25-27	---	---	---	---	---				
Dp <sup>a</sup> , Ds <sup>a</sup> . Dumps										
DuB <sup>a</sup> : Duncannon-----	0-8	10-25	1.20-1.40	0.6-2.0	0.16-0.20	5.1-6.0	Low-----	0.43	3	1-4
	8-95	10-25	1.20-1.40	0.6-2.0	0.14-0.16	5.1-6.5	Low-----	0.64		
Urban land.										
EbB, EbC, EbD, EbE----- Elba	0-9	18-40	1.20-1.50	0.2-0.6	0.15-0.19	5.6-7.3	Moderate-----	0.43	3	1-3
	9-42	35-60	1.40-1.60	0.06-0.2	0.09-0.15	5.6-8.4	High-----	0.32		
	42-54	35-60	1.40-1.75	0.06-0.2	0.06-0.16	7.4-8.4	High-----	0.32		
	54-56	---	---	---	---	---				
ElB, ElC, ElD----- Elkinsville	0-9	15-26	1.30-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low-----	0.37	5	.5-2
	9-56	22-30	1.40-1.60	0.6-2.0	0.18-0.22	4.5-6.0	Moderate-----	0.37		
	56-68	16-30	1.45-1.65	0.6-2.0	0.15-0.20	4.5-6.0	Moderate-----	0.37		
FbB, FbD----- Fairpoint	0-5	27-35	1.45-1.65	0.2-0.6	0.06-0.15	5.6-7.3	Moderate-----	0.37	5	<.5
	5-60	18-35	1.60-1.80	0.2-0.6	0.03-0.10	5.6-7.3	Moderate-----	0.37		
FcB, FcD----- Fairpoint	0-8	27-40	1.40-1.65	0.2-0.6	0.12-0.18	5.6-7.3	Moderate-----	0.43	5	.5-2
	8-60	18-35	1.60-1.80	0.2-0.6	0.03-0.10	5.6-7.3	Moderate-----	0.32		
FtA----- Fitchville	0-10	16-27	1.30-1.50	0.6-2.0	0.17-0.21	4.5-6.5	Low-----	0.37	5	2-4
	10-52	18-35	1.45-1.70	0.2-0.6	0.15-0.19	4.5-7.3	Moderate-----	0.37		
	52-70	16-30	1.40-1.65	0.2-2.0	0.14-0.18	5.6-7.8	Low-----	0.37		
He----- Hartshorn	0-24	18-27	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low-----	0.32	3	1-3
	24-40	4-10	1.45-1.60	2.0-20	0.03-0.06	5.6-7.3	Low-----	0.10		
	40-42	---	---	---	---	---				
LeB, LeC, LeD, LeE, LeF----- Lowell	0-7	18-27	1.30-1.50	0.6-2.0	0.18-0.23	4.5-6.5	Low-----	0.37	3	1-4
	7-18	27-33	1.30-1.60	0.2-2.0	0.16-0.20	4.5-6.5	Moderate-----	0.32		
	18-42	40-55	1.50-1.70	0.2-0.6	0.09-0.13	4.5-7.8	Moderate-----	0.28		
	42-50	27-35	1.45-1.65	0.2-2.0	0.05-0.14	5.6-7.8	Moderate-----	0.28		
50-52	---	---	---	---	---					
LoB <sup>b</sup> , LoC <sup>b</sup> , LoD <sup>b</sup> , LoE <sup>b</sup> , LoF <sup>b</sup> , LpF <sup>b</sup> Lowell-----	0-7	18-27	1.30-1.50	0.6-2.0	0.18-0.23	4.5-6.5	Low-----	0.37	3	1-4
	7-18	27-33	1.30-1.60	0.2-2.0	0.16-0.20	4.5-6.5	Moderate-----	0.32		
	18-42	40-55	1.50-1.70	0.2-0.6	0.09-0.13	4.5-7.8	Moderate-----	0.28		
	42-50	27-35	1.45-1.65	0.2-2.0	0.05-0.14	5.6-7.8	Moderate-----	0.28		
	50-52	---	---	---	---	---				
Westmoreland-----	0-8	15-27	1.20-1.40	0.6-2.0	0.16-0.20	4.5-6.0	Low-----	0.37	3	1-4
	8-28	18-35	1.20-1.50	0.6-2.0	0.12-0.18	4.5-6.0	Low-----	0.28		
	28-50	18-35	1.20-1.50	0.6-2.0	0.06-0.10	4.5-5.5	Low-----	0.17		
	50-52	---	---	---	---	---				
MnB, MnD, MnE----- Morristown	0-8	27-40	1.40-1.65	0.2-0.6	0.13-0.18	6.1-8.4	Moderate-----	0.43	5	.5-2
	8-60	25-35	1.65-1.90	0.2-0.6	0.03-0.11	7.4-8.4	Moderate-----	0.32		
MoB, MoD, MoE----- Morristown	0-5	27-40	1.50-1.75	0.2-0.6	0.07-0.14	6.1-8.4	Moderate-----	0.32	5	<.5
	5-60	25-35	1.65-1.90	0.2-0.6	0.03-0.11	7.4-8.4	Moderate-----	0.32		
MoF----- Morristown	0-5	27-40	1.50-1.75	0.2-0.6	0.02-0.07	6.1-8.4	Moderate-----	0.32	5	<.5
	5-60	25-35	1.65-1.90	0.2-0.6	0.02-0.07	7.4-8.4	Moderate-----	0.32		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm <sup>3</sup>	In/hr	In/in	pH				Pct
WmB, WmC, WmD, WmE, WmF Westmoreland	0-8	15-27	1.20-1.40	0.6-2.0	0.16-0.20	4.5-7.3	Low-----	0.37	3	1-4
	8-50	18-35	1.20-1.50	0.6-2.0	0.12-0.18	4.5-6.0	Low-----	0.28		
	50-52	---	---	---	---	---	---	---		
WoC <sup>a</sup> , WoD <sup>a</sup> : Westmoreland	0-8	15-27	1.20-1.40	0.6-2.0	0.16-0.20	4.5-6.0	Low-----	0.37	3	1-4
	8-50	18-35	1.20-1.50	0.6-2.0	0.12-0.18	4.5-6.0	Low-----	0.28		
	50-52	---	---	---	---	---	---	---		
Upshur	0-6	27-35	1.20-1.50	0.2-0.6	0.12-0.16	4.5-6.5	Moderate-----	0.43	3	.5-3
	6-28	40-55	1.30-1.60	0.06-0.2	0.10-0.14	4.5-8.4	High-----	0.28		
	28-60	27-45	1.30-1.60	0.06-0.2	0.08-0.12	5.1-8.4	Moderate-----	0.28		
ZnB, ZnC Zanesville	0-8	12-27	1.35-1.40	0.6-2.0	0.19-0.23	4.5-7.3	Low-----	0.37	3	1-2
	8-25	18-35	1.35-1.45	0.6-2.0	0.17-0.22	4.5-6.0	Low-----	0.37		
	25-46	18-33	1.50-1.75	0.06-0.6	0.08-0.12	4.5-6.0	Low-----	0.37		
	46-59	20-40	1.50-1.70	0.2-2.0	0.08-0.12	4.5-6.0	Low-----	0.28		
	59-61	---	---	---	---	---	---	---		

<sup>a</sup> See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

[See text for definitions of symbols and terms such as "rare," "brief," "apparent," and "perched." The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Potential frost action	Uncoated steel	Concrete
AeC----- Allegheny Variant	B	None-----	---	---	2.0-3.5	Apparent	Dec-Apr	>60	---	High-----	Low-----	High.
As----- Ashton	B	Occasional	Very brief	Dec-May	>6.0	---	---	>60	---	High-----	Low-----	Low.
BaB, BaD, BaF, BcB, BcD----- Barkcamp	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	High-----	High.
BeB, BeD, BhB, BhD, BhE, BhF----- Bethesda	C	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
BsC, BsD, BsE----- Brookside	C	None-----	---	---	2.5-4.0	Perched	Mar-Jun	>60	---	Moderate	Moderate	Moderate.
BuB <sup>u</sup> , BuD <sup>u</sup> : Brookside----- Urban land.	C	None-----	---	---	2.5-4.0	Perched	Mar-Jun	>60	---	Moderate	Moderate	Moderate.
Cg----- Chagrin	B	Occasional	Brief-----	Nov-May	4.0-6.0	Apparent	Feb-Mar	>60	---	Moderate	Low-----	Moderate.
ChB----- Chilli	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Low-----	High.
CmB <sup>u</sup> : Chilli----- Urban land.	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Low-----	High.
CuB, CuC----- Culleoka	B	None-----	---	---	>6.0	---	---	20-40	Soft	Moderate	Low-----	Moderate.
DkB, DkC, DkD, DkE, DmF----- Dekalb	C	None-----	---	---	>6.0	---	---	20-40	Hard	Low-----	Low-----	High.
Dp <sup>u</sup> , Ds <sup>u</sup> . Dumps												
DuB <sup>h</sup> : Duncannon----- Urban land.	B	None-----	---	---	3.0-6.0	Apparent	Dec-Apr	>60	---	High-----	Low-----	Moderate.

See footnotes at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion		
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Potential frost action	Uncoated steel	Concrete
EBB, EBC, EBD, EbE- Elba	C	None	---	---	>6.0	---	---	>40	Hard	Moderate	High	Low.
EIB, EIC, EID- Elkinsville	B	None	---	---	>6.0	---	---	>60	---	High	Moderate	High.
FBB, FBD, FeB, FcD- Fairpoint	C	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
FtA- Fitchville	C	None	---	---	1.0-2.5	Perched	Nov-Jun	>60	---	High	High	Moderate.
He- Hartshorn	B	Occasional	Brief	Jan-Apr	>6.0	---	---	40-72	Hard	Moderate	Low	Moderate.
LeB, LeC, LeD- Lowell	C	None	---	---	2.5-5.0	Perched	Jan-Mar	>40	Hard	Moderate	High	Moderate.
LeE, LeF- Lowell	C	None	---	---	>6.0	---	---	>40	Hard	Moderate	High	Moderate.
LoB <sup>b</sup> , LoC <sup>d</sup> , LoD <sup>b</sup> : Lowell	C	None	---	---	2.5-5.0	Perched	Jan-Mar	>40	Hard	Moderate	High	Moderate.
Westmoreland	B	None	---	---	3.0-6.0	Apparent	Mar-May	>40	Hard	Moderate	Low	High.
LoE <sup>b</sup> , LoF <sup>b</sup> , LpF <sup>b</sup> : Lowell	C	None	---	---	>6.0	---	---	>40	Hard	Moderate	High	Moderate.
Westmoreland	B	None	---	---	3.0-6.0	Apparent	Mar-May	>40	Hard	Moderate	Low	High.
MnB, MnD, MnE- Morristown	C	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
MoB, MoD, MoE, MoF- Morristown	C	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Ne- Newark	C	Frequent	Brief	Jan-Apr	0.5-1.5	Apparent	Dec-May	>60	---	High	High	Low.
Mn <sup>aa</sup> - Newark	D	Frequent	Very long	Oct-Jun	+1-1.0	Apparent	Sep-Jul	>60	---	High	High	Low.
Mn- Newark Variant	B	Frequent	Very brief	Jan-Apr	1.0-2.5	Apparent	Dec-Apr	40-72	Hard	High	High	Low.
Mo- Molin Variant	B	Occasional	Brief	Feb-Apr	4.0-6.0	Apparent	Feb-Apr	>60	---	High	Low	Low.
Mu <sup>b</sup> : Molin Variant	B	Occasional	Brief	Feb-Apr	4.0-6.0	Apparent	Feb-Apr	>60	---	High	Low	Low.

See footnotes at end of table.

TABLE 16.---SOIL AND WATER FEATURES---Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion		
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Potential frost action	Uncoated steel	Concrete
					Ft		In					
Nu <sup>b</sup> : Urban land.												
OtB, OtC----- Otwell	C	None-----	---	---	3.5-6.0	Perched	>60	---	---	High-----	Moderate	High.
RcC, RcD, RcE, RnB----- Richland	B	None-----	---	---	3.0-6.0	Apparent	>60	---	---	Moderate	Moderate	Moderate.
Uc <sup>a</sup> : Udorthents----- Pits.	---	---	---	---	---	---	---	---	---	---	---	---
Ud <sup>b</sup> : Udorthents----- Urban land.	---	---	---	---	---	---	---	---	---	---	---	---
WhB, WhC----- Wellston	B	None-----	---	---	>6.0	---	>40	Hard	Hard	High-----	Moderate	High.
WkB, WkC, WkD----- Westmore	C	None-----	---	---	>6.0	---	>48	Soft	Soft	High-----	High-----	Moderate.
WmB, WmC, WmD, WmE, WmF----- Westmoreland	B	None-----	---	---	3.0-6.0	Apparent	>40	Hard	Hard	Moderate	Low-----	High.
Woc <sup>a</sup> , Wod <sup>b</sup> : Westmoreland-----	B	None-----	---	---	3.0-6.0	Apparent	>40	Hard	Hard	Moderate	Low-----	High.
Upshur-----	C	None-----	---	---	>6.0	---	>40	Soft	Soft	Moderate	High-----	Moderate.
ZnB, ZnC----- Zanesville	C	None-----	---	---	2.0-3.0	Perched	40-80	Hard	Hard	High-----	Moderate	High.

\* See description of the map unit for composition and behavior characteristics of the map unit.

\*\* The plus sign preceding the range in depth for the water table means that the range in this soil is from 1 foot above the surface to 1 foot below.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
OtB----- Otwell	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Slight-----	Fair: too clayey.
OtC----- Otwell	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, too clayey.	Moderate: slope.	Fair: too clayey, slope.
RcC----- Richland	Severe: wetness.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, small stones, slope.
RcD, RcE----- Richland	Severe: wetness, slope, slippage.	Severe: slope, wetness.	Severe: wetness, slope, slippage.	Severe: wetness, slope.	Poor: slope.
RhB----- Richland	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, small stones.
Uc*: Udorthents.  Pits.					
Ud*: Udorthents.  Urban land.					
WhB----- Wellston	Moderate: depth to rock, percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Fair: area reclaim.
WhC----- Wellston	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: area reclaim, slope.
WkB----- Westmore	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
WkC----- Westmore	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: slope, depth to rock.	Poor: too clayey, hard to pack.
WkD----- Westmore	Severe: slope, percs slowly.	Severe: slope.	Severe: slope, depth to rock, too clayey.	Severe: slope.	Poor: slope, too clayey, hard to pack.
WmB----- Westmoreland	Moderate: depth to rock.	Moderate: slope, seepage.	Severe: depth to rock.	Moderate: depth to rock.	Fair: area reclaim, thin layer.
WmC----- Westmoreland	Moderate: slope, depth to rock.	Severe: slope.	Severe: depth to rock.	Moderate: slope, depth to rock.	Fair: slope, area reclaim, thin layer.
WmD, WmE, WmF----- Westmoreland	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

the more droughty Dekalb soils are included near slope breaks on some ridgetops. Also included are areas underlain by hard bedrock. Included soils make up about 20 percent of most areas.

Permeability is moderate or moderately rapid in this Culleoka soil, and available water capacity is low. Runoff is rapid in cultivated areas. The shrink-swell potential is low. Potential frost action is moderate. The root zone is moderately deep over sandstone bedrock. Unless the soil has been limed, reaction in the root zone is medium acid or strongly acid in the topsoil and subsoil and strongly acid to slightly acid in the substratum.

Most areas are used for hay, pasture, or cultivated crops. The potential is medium for cultivated crops, hay, pasture, and building site development, low to medium for sanitary facilities, and high for trees and for openland and woodland wildlife habitat.

This soil is suited to cultivated crops and small grain and to grasses and legumes for hay, but it is droughty. If it is cultivated or the protective cover is removed, the erosion hazard is severe. Controlling erosion, conserving moisture, and maintaining tilth and organic matter content are concerns of management. If conservation measures are used, a common rotation includes a cultivated crop or small grain about half the time of the rotation. Conservation tillage, which leaves crop residue on the surface, grasses and legumes, cover crops, and contour stripcropping reduce the hazard of erosion. Tilling within the optimum moisture range helps to prevent soil compaction.

This soil is suited to pasture. Deep-rooted legumes are difficult to maintain in many areas. Reseeding with cover crops or companion crops or by trash mulch or no-till seeding reduces the hazard of erosion. Proper stocking, pasture rotation, mowing to control weeds, and timely application of lime and fertilizer are needed to maintain a good stand of key forage plants. Limiting grazing in winter and other wet periods helps to prevent soil compaction.

This soil is suited to trees. Locating skid trails and logging roads on the contour helps to control runoff and erosion. Mechanical planting and mowing to reduce plant competition are possible.

This soil is suitable as a site for buildings even though the slope and depth to bedrock are limitations, especially for houses with basements. Local roads can be improved by using a suitable base material. Locating driveways across the slope reduces the angle of incline and erosion. The slope, bedrock, and possible contamination of ground water are severe limitations for sanitary facilities.

The capability subclass is IIIe. The woodland suitability subclass is 2o.

**DkE—Dekalb loam, 3 to 8 percent slopes.** This moderately deep, gently sloping, well drained soil is mainly on narrow ridgetops and low knolls. A few areas are near slope breaks on broad ridgetops. Slopes are

smooth and even to convex. Most areas are 2 to 20 acres.

Typically, the surface layer is brown, friable loam about 6 inches thick. The subsoil is yellowish brown, friable channery loam and very channery loam about 17 inches thick. The substratum is yellowish brown, very friable very channery sandy loam. Hard, brown and olive brown fine and medium grained sandstone is at a depth of about 28 inches.

Included with this soil in mapping are small areas of the more silty Culleoka soils and the deep, more silty Westmoreland soils at the center of ridgetops. Both of those soils have a lower content of coarse fragments in the subsoil and higher available water capacity than this Dekalb soil. Included soils make up about 20 percent of most areas.

Permeability is rapid or moderately rapid, and the available water capacity is very low. Runoff is slow from cultivated areas. The soil dries rapidly after rains. Sandstone fragments are common in the surface layer, and the content generally increases with increasing depth to about 80 percent by volume in the substratum. Potential frost action and the shrink-swell potential are low. The root zone is moderately deep over sandstone bedrock. In unlimed areas, reaction in the root zone is very strongly acid or strongly acid.

Most of the acreage is farmed. The potential is medium for building site development, medium or low for sanitary facilities, and medium for cultivated crops, hay, pasture, and trees.

This soil is suited to cultivated crops, small grain, and hay. The hazard of droughtiness, however, is severe. The soil warms and dries early in spring and is well suited to early spring planting. Yields of corn and late cuttings of hay are generally reduced because of the very low available water capacity. Deep-rooted legumes, such as alfalfa, are difficult to maintain in many areas. In cultivated areas, the hazard of erosion is moderate. Controlling erosion, maintaining tilth and organic matter content, and conserving moisture are concerns of management. Conservation tillage, which leaves crop residue on the surface, grasses and legumes in the cropping system, incorporating crop residue into the plow layer, and cover crops, contour tillage, and stripcropping reduce the hazard of erosion and improve tilth and organic matter content. The soil dries and warms early in spring and is especially well suited to early season crops. Because nutrients are rapidly leached, the soil generally responds better to smaller but more frequent or timely applications of fertilizer than to one large application.

This soil is suited to pasture and is especially well suited to grazing early in spring. Because the very low available water capacity results in droughtiness in summer, early spring seeding is best. Seeding with companion crops or cover crops reduces the hazard of erosion. Proper stocking, pasture rotation, mowing to control weeds, and timely application of lime and

root zone of the Lowell soil is very strongly acid to medium acid in the upper part and strongly acid to neutral in the lower part. The root zone of the Westmoreland soil is very strongly acid to medium acid.

These soils are used mainly for pasture, trees, and woodland wildlife habitat. The potential is medium for hay and pasture and low for cultivated crops, small grain, sanitary facilities, and building site development. The potential for woodland wildlife habitat is high in both soils.

substratum is light olive brown, firm channery clay loam. Hard limestone bedrock is at about 45 inches.

Typically, the surface layer of the Westmoreland soil is brown, friable silt loam about 5 inches thick. The subsoil is about 24 inches thick. The upper and middle parts are brown and dark yellowish brown, friable silt loam and firm clay loam, and the lower part is yellowish brown, firm channery clay loam. The substratum is yellowish brown, firm channery clay loam. Hard sandstone bedrock is at about 42 inches.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
WmD, WmE, WmF----- Westmoreland	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
WoC <sup>a</sup> : Westmoreland-----	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
Upshur-----	Moderate: slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: slope, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: slope.
WoD <sup>a</sup> : Westmoreland-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Upshur-----	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell, low strength.	Severe: slope.
ZnB----- Zanesville	Moderate: depth to rock.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Severe: frost action.	Slight.
ZnC----- Zanesville	Moderate: slope, depth to rock.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: slope.

<sup>a</sup> See description of the map unit for composition and behavior characteristics of the map unit.

INTER-OFFICE CORRESPONDENCE

THE NACCO MINING COMPANY

POWHATAN POINT, OHIO 43942

DATE: November 9, 1984

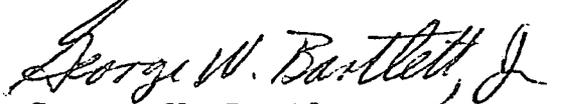
TO: Mr. Andrew S. Good, Attorney

SUBJECT: OPTION TO PURCHASE PROPERTY FOR PROPOSED PORTAL  
AND VENTILATION FACILITIES

Please find attached a copy of an Option to Purchase that we had Mr. Mario Busack of Busack Realty secure for us. It is our intention to use this option as our basis for submitting the proper documents to ODNR for a Mine Permit boundary revision to install a ventilation facility and possibly a mine portal for The Nacco Mining Company.

Do you have any problems with either the option form or our intentions?

Very truly yours,



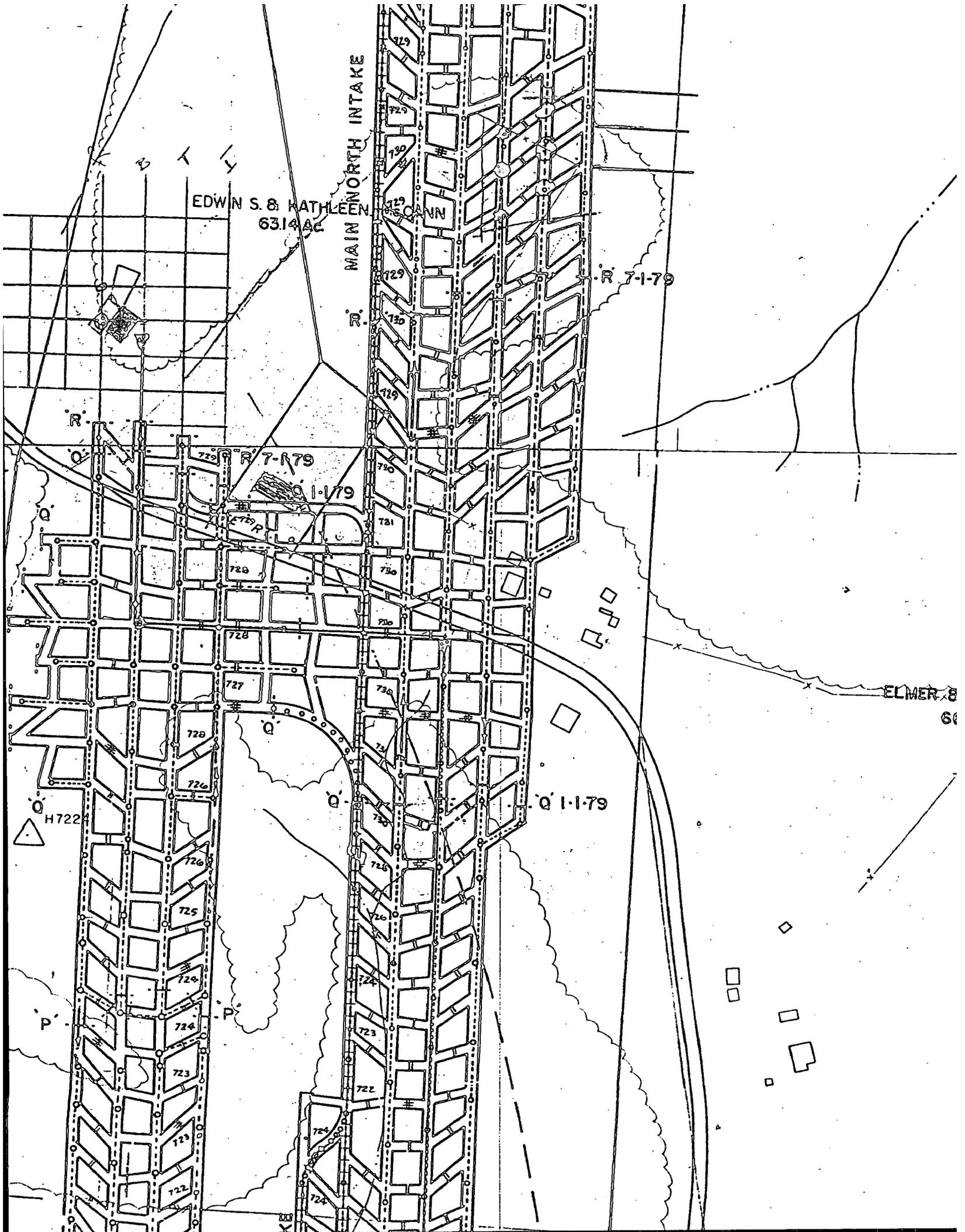
George W. Bartlett, Jr.  
Vice President - Engineering

GWB:jlr

Attachment (1)

Copies to: J. Forrelli (w/o attachment)  
A. Jerico (w/o attachment)  
B. Kranz (w/o attachment)  
P. Marozzi (w/o attachment)  
F. Miller (w/o attachment)  
E. Schanck (w/o attachment)  
D. Ward (w/o attachment)  
L. Watson (w/o attachment) ✓

TOVCC 16973



EDWIN S. & KATHLEEN SCANN  
63.14 AC

MAIN NORTH INTAKE

R. 7-1-79

Q 1-1-79

R. 7-1-79

ELMER S. 64

Q 1-1-79

SECTION A - A

0+00	1300	
0+75	1290	
2+55	12+80	2+40 end of SECTION

SECTION B - B

0-20	1290	
0+00		
0+60	HIGHEST PART OF SECTION	1295
1+31	1290	
1+76	1280	
2+21	1270	
2+62	1260	
2+95	1250	
3+20	1240	
3+39	1230	
3+69	1220	
4+00	1210	
4+38	1200	

SECTION C - C

0-20	1290	
0+00		
0+15	TOP OF SECT. ON	
0+53	1290	
0+99	1280	
1+39	1270	
1+78	1260	
2+08	1250	
2+36	1240	
2+78	1230	
3+00	1220	
3+21	1210	
3+61	1200	
4+15	1192	

0+15 FF

SECTION D-D

0+00	1180
0+34	1190
0+77	1200
1+12	1210
1+33	1220
1+57	1230
1+80	1240
2+05	1250
2+45	1260
2+73	1270
3+33	1280
3+75	TOP OF SEC.
4+10	1280
4+66	<del>1270</del>
5+06	1260
5+31	1250
5+65	1240
6+11	1230
6+35	1220
6+51	1210
6+90	1200

3+90 Feb

SECTION E-E

0+00	1210
0+16	1220
0+39	1230
0+58	1240
0+83	1250
1+03	1260
1+36	1270
1+82	1280
2+09	1290
2+95	TOP OF SECTION.
3+10	1290

2+55 F-F

2+55 TOP OF SECTION

SECTION F-F

0+00	
2+03	1290
3+62	1280
4+12	1270
5+22	1260
5+68	1250
6+00	1240
6+11	1230
6+59	1220
6+83	1210
7+30	1200

1+31 E-F  
3+12 D-D  
1+65 CC

SECTION G-G

0+00	1278
0+80	1270
1+32	1260
1+56	1250
1+91	1290
2+22	1230
2+60	1220
2+80	1210
3+22	1200
3+75	1190
4+17	1180
4+50	1170
4+70	1160
4+90	1150

F'-F' 0+00

0+25 SITE 1  
1+50 SITE 2

INTER OFFICE CORRESPONDENCE

THE NORTH AMERICAN COAL CORPORATION  
AND SUBSIDIARY COMPANIES

DATE March 26, 1985

TO Dan Mitchell, Director-Corporate Records

SUBJECT BONDING, THE NACCO MINING COMPANY - POWHATAN NO. 6 MINE  
ODNR PERMIT NO. D-0360

The Nacco Mining Company currently has reclamation bonds covering

262.75 acres at \$2500.00 per acre  
Totaling \$656,875.00

SB 18574 \$625,000.00  
SB 25711 31,875.00

It is necessary to increase this bond to cover

354.00 acres at \$2500.00 per acres  
Total amount \$885,000.00

The receipt amalgamation of the Quarto Letters of Credit was very successful. The same procedure might be implemented at Nacco at this time. It is expected that this acreage will be affected for several years.

If you have questions, please contact me.

*Louise*

INTER OFFICE CORRESPONDENCE

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If you have questions, please contact me.

*Louise*

BRIDGEPORT, OHIO 43912

OPTION TO PURCHASE

consideration of the payment by MARIO D. BUSACK JR., Real Estate Broker

\$ 10.00 (TEN AND NO/100) hereinafter referred to as Optionee, in the amount DOLLAR

receipt of which is hereby acknowledged, Michael P. Kotlas and SANDRA K. Kotlas

hereinafter referred to as Optionor, grants to Optionee an option to purchase the real property situated in City of Township of Smith, County of Belmont, State of Ohio

described as being in the Southeast quarter of Section 19, Township 6, Range 4 and consisting of 20 acres, more or less.

for a PURCHASE PRICE OF \$ 50,000.00 (Fifty thousand) DOLLAR

upon the following TERMS and CONDITIONS:

- 1) PERMANENT EASEMENT FOR SEPTIC SYSTEM.
2) REASONABLE TIME TO RELOCATE CABLE.
3) 100 FEET FRONTAGE FOR ACCESS OF R.R. 4. Beginning at CORNER of EMIOS PROPERTY.

ENCUMBRANCES: In addition to any encumbrances referred to above, Optionee shall take title to the property subject to: 1) Real Estate Taxes not yet paid and 2) Covenants, conditions, restrictions, reservations, rights, rights of way and easements of record, if any, which do not materially affect the value intended use of the property.

The amount of any bond or assessment which is a lien shall be paid, assumed by Optionor

EXAMINATION OF TITLE: Fifteen (15) days from date of exercise hereof are allowed the Optionee to examine the title to the property and to report writing any valid objections thereto. Any exceptions to the title which would be disclosed by examination of the records shall be deemed to have been accepted unless reported in writing within said 15 days.

EVIDENCE OF TITLE. Evidence of Title shall be in the form of a policy of title insurance, other: MARKETABLE RECORDS to be paid for by Optionee

CLOSE OF ESCROW: Within days from exercise of the option, or upon removal of any exceptions to the title by the Optionor, as provided above whichever is later, both parties shall deposit with an authorized escrow holder, to be selected by the Optionee, all funds and instruments necessary to complete the sale in accordance with the terms and conditions hereof.

POSSESSION: Possession shall be delivered to Optionee. Upon recordation of the deed. After recordation, but not later than Unless Optionor has vacated the premises prior to recordation of the deed, Optionor agrees to pay Optionee \$ per day from recordation to date possession is delivered and to leave this sum in escrow, to be disbursed to the persons entitled thereto on the date possession is delivered.

PRORATIONS: Rents, taxes, premiums on insurance, acceptable to optionee, interest and other expenses of the property to be prorated as of recordation date. Security deposits, advance rentals or considerations involving future lease credits shall be credited to Optionee.

MAINTENANCE: Until possession is delivered Optionor agrees to maintain heating, sewer, plumbing and electrical systems and any built-in appliances equipment in normal working order, to keep the roof watertight and to maintain the grounds.

NOTICES: By acceptance hereof, Optionor warrants that he has no notice of violations relating to the property from City, County or State agencies.

TIME: Time is of the essence of this agreement.

EXPIRATION OF OPTION: If not exercised, this option shall expire 90 days from date and Optionor shall be released from all obligations hereunder and all of Optionee's rights hereunder, legal or equitable, shall cease and the consideration hereinabove received for by Optionor shall be retained by Optionor.

EXERCISE OF OPTION: The option shall be exercised by mailing or delivering written notice to the Optionor prior to the expiration of this option and an additional payment, on account of the purchase price, in the amount of \$ 5,000.00 (FIVE THOUSAND AND NO/100) DOLLAR

for account of Optionor to the authorized escrow holder referred to above, prior to the expiration of this option.

Notice, if mailed, shall be by certified mail, postage prepaid, to the Optionor at the address set forth below, and shall be deemed to have been given on the day following the day shown on the postmark of the envelope in which such notice is mailed.

In the event the option is exercised, the consideration hereinabove received for by Optionor shall shall not be credited upon the purchase price

NOTICE: The amount or rate of real estate commissions is not fixed by law. They are set by each Broker individually and may be negotiated between the Seller and Broker.

AGENT'S FEE: Upon execution of this option the Optionor agrees to pay to N/A the Agent in this transaction, the sum of \$ ( DOLLARS) and in the event the option is exercised, Optionor

agrees to pay Agent the additional sum of \$ N/A DOLLAR for services rendered. This agreement shall not limit the rights of Agent provided for in any listing or other agreement which may be in effect between Optionor and Agent. In the event legal action is instituted to collect this fee, or any portion thereof, the Optionor agrees to pay the Agent a reasonable attorney's fee and all costs in connection with such action.

DATED: 29 Sept 1984

Michael P. Kotlas Optionor, Sandra K. Kotlas Optionor, 59165 ARMSTRONG - CENTERVILLE RD. Address, JACOBSBURG Phone 686-2076, Busack Realty Agent

Mario D. Busack Jr Optionor, Real Estate Broker, 224 Howard St Bridgeport Address, 614-635-3525 Phone, 224 Howard St. BRIDGEPORT, OH. Agent's Address

By Mario D. Busack Jr (614) 635-3525 Agent's PI

STONE

S 87°-00' E 854.70'

STONE



MICHAEL P. KOTLAS  
SANDRA K. KOTLAS

OPTIONAL TRACT

S 10°-52' E 1206.17'

1474.77

N 4°-08' E

I.P. 548°-22' E 147.50' I.P.

N 32°-24' E 315.52'

576°-11' E 395.74'

N 32°-24' E 173.88'

100' I.P. S.R. 576°-11' E

200'

417.63'

1521°-30' E 141.18'

285.00'

STATE

ROUTE No. 9

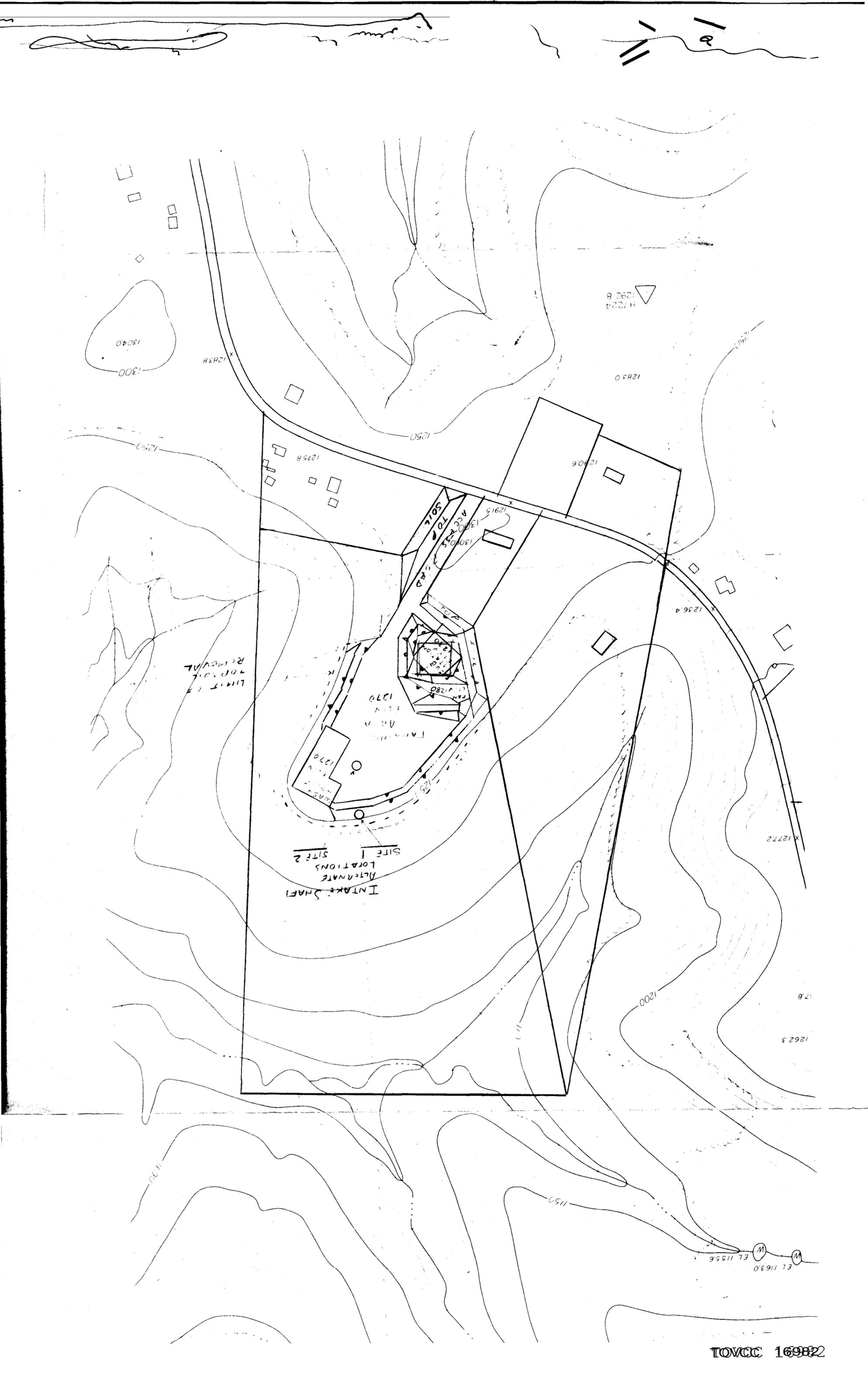
ADDENDUM TO OPTION DATED 9-29-84

11-23-84

Michael P. Kotlas

Sandra K. Kotlas

Michael P. Kotlas



H. 2224  
1292.8

1300  
1304.0

X 1283.8

1285.0

1250

1275.8

1250

1280.6

1291.5

1300.4

1300.5

X 1236.4

LIMIT OF  
TOP SOIL  
REMOVAL

FARMING  
AREA  
1270

WASH  
HOUSE  
1270

INTAKE SHAFT  
ALTERNATE  
LOCATIONS  
SITE 1  
SITE 2

X 1277.2

1200

1287.8

1262.3

1150

1150

W  
EL. 1155.6  
W  
EL. 1163.0

# THE NACCO MINING COMPANY

POWHATAN POINT, OHIO 43942

November 17, 1984

U.S. Department of Agriculture  
Soil Conservation Service  
Bannock Road  
St. Clairsville, Ohio 43950

Dear Sir:

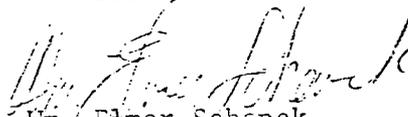
I would like to have a prime farm land determination on the area outlined in red on the attached copy of sheet No. 61 of Soil Survey of Belmont County.

The area is located near the center of the Southeast quarter of Section 19, Smith Township, Belmont County, T6N, R4W. The area is located on top of a ridge along State Route 9 and contains soil types of the following names and symbols: Culleoka (CuC), Lowell (LoE) and Westmoreland (WmD).

Thank you for your time and if you have any questions, please contact me.

Very truly yours,

THE NACCO MINING COMPANY  
Powhatan No. 6 Mine

  
Wm. Elmer Schanck  
Chief Mine Engineer

WES:crm  
Attachment

Copies to: Ms. A. Jerico  
File

TOVCC 16983



THE NACCO MINING COMPANY  
12800 SHAKER BOULEVARD  
CLEVELAND, OHIO 44120

April 4, 1985

Mr. Bill Sterling  
Division of Reclamation  
Department of Natural Resources  
Fountain Square, Building B  
Columbus, Ohio 43224

RE: THE NACCO MINING COMPANY  
POWHATAN NO. 6 MINE  
INCIDENTAL BOUNDARY REVISION  
AIRSHAFT NO. 4

Dear Mr. Sterling:

Enclosed is a check in the amount of \$320.00 to cover the permit fee for the 6.40 acre Airshaft No. 4. The paperwork for the bond amount is being completed, and will be forwarded to Mr. Dave Hume per our discussion.

Thank you.

Very truly yours,



Louise Watson  
Permit Coordinator

LWatson/ab

10056 TREASURER OF STATE OF OHIO

DATE	INVOICE NUMBERS	MEMO	INVOICES CREDITS	DISCOUNTS	BALANCES
3/31/85	PERMIT FEE		320.00		320.00
THE NACCO MINING COMPANY CLEVELAND, OHIO 44120			320.00		320.00

REMITTANCE ADVICE

PLEASE DETACH BEFORE DEPOSITING

THE NACCO MINING COMPANY  
CLEVELAND, OHIO 44120

6-103  
410

No. 67708

MAIN OFFICE  
SOCIETY NATIONAL BANK  
OF CLEVELAND

VOID AFTER SIX MONTHS

THE SUM OF \*\*\*\*\*320 DOLLARS AND 00 CENTS

PAY TO THE  
ORDER OF

DATE

AMOUNT

4/04/85

67708

\$320.00

THE NACCO MINING COMPANY

TREASURER OF STATE OF OHIO

  
AUTHORIZED SIGNATURES

⑆04 100 1039⑆ 054 001 2606⑈

INTER OFFICE CORRESPONDENCE

THE NORTH AMERICAN COAL CORPORATION  
AND SUBSIDIARY COMPANIES

DATE March 13, 1986

TO Dan Mitchell

SUBJECT RECLAMATION BONDING - THE NACCO MINING COMPANY PERMIT  
D-0360

The Powhatan No. 6 Mine will be constructing a new airshaft (No. 5 Airshaft) during April, 1986. An additional 10 acres will require a reclamation bond.

<u>DESCRIPTION</u>	<u>ACRES</u>	<u>AMT./AC.</u>	<u>TOTAL INCREASE</u>	<u>DATE REQUIRED</u>
No. 5 Airshaft	10	\$2500/ac.	\$25,000	April 4, 1986

The attached form has recently been devised by ODNR to be included with any monies forwarded to the Division of Reclamation. Please attach it to the entire package sent to Columbus to facilitate their handling. If you have any questions, please call me.

  
Louise Watson

LW:ab

PAYMENT TO THE OHIO DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF RECLAMATION

Please submit a completed copy of this form, or the same information on a plain sheet of paper, each time you send a check or bond to the Division of Reclamation.

<u>Purpose of Payment</u>	<u>Appk./Permit #</u>	<u>Amount</u>
1.) Bond	<u>D-0433</u>	<u>\$ 25,000</u>
A. Initial Bond (New Application)		
B. Additional Bond		
<del>XXX</del> Bond for I.B.R.		
D. Bond for substitutions		
2.) Acreage Fees	<u>                    </u>	<u>\$</u>
A. Initial		
B. I.B.R.		
3.) Civil Penalty Assessment (Always include the C.P.A.#)	<u>                    </u>	<u>\$</u>
4.) Purchase set of rules	<u>                    </u>	<u>\$</u>
5.) Other (please specify)	<u>                    </u>	<u>\$</u>
	TOTAL	<u>\$</u>

Submitted by

  
Signature

house,

Does this have any relevance to the  
attached memo or is this another  
one?

VAC

April 10, 1985

04-12-85

Nacco Mining Company  
86854 Pleasant Ridge Road  
Alledonia, Ohio 43902

Gentlemen:

This is to notify you that bond and fees are due for the  
incidental boundary revision on permit D-0360.

If the I.B.R. is complete, upon receipt of the acreage bond  
and fee, in the amounts listed below, your incidental boundary  
revision will be approved by the Chief.

Acreage Fee - \$ 320.00 *0.4ac.*

Bond - \$16,000.00

The check for acreage fees should be made payable to:  
Treasurer, State of Ohio. The fee and bond shall be submitted  
together, within thirty (30) days receipt of this letter.

Failure to submit bond and fees within the allotted time  
will result in a notice of violation.

If you have any questions, please contact me at (614) 265-  
6628.

Sincerely,

*Bill Sterling*

Bill Sterling  
Permits & Processing Section

BGS:jl

cc: File  
St. Clairsville District Office

Certified #P738832922

Richard F. Celeste, Governor · Lt. Gov. Myrl H. Shoemaker, Director

April 11, 1985

TO: Nacco Mining Company  
FROM: Gordon Hufford, Permits & Processing Section *GAH*  
SUBJECT: INCOMPLETE INCIDENTAL BOUNDARY REVISION

Your I.B.R. for Permit D-0360 was received on March 29, 1985. The I.B.R. has been judged incomplete.

The I.B.R. will be considered complete upon receipt of the following information:

1. The I.B.R. maps are enclosed. Clearly show surface and mineral owners on permit area. Not just coal or "surface optioned" by.
2. Show surface owner on Napier property.
3. Label property line between Ewing property and I.B.R. area. Also, between Kotlas property and I.B.R. area.
4. Attachment 4's must also list adjacent mineral owners not just surface owners.
5. Small drainage exemption can only be approved if revised to include use of straw bales or sumps around the topsoil areas. Also, show diversion and sump locations clearly on the map.
6. Map must include a note that the 6.4 acres are covered by a small area drainage exemption.
7. It is unclear what the extent of the tree planting area will be. Show clearly. Will the trees only be planted along the perimeter of the topsoil storage area or on the entire topsoil storage area? Also, what about the smaller topsoil storage area?

If you have any questions, please contact Bill Sterling  
at (614) 265-6628.

GLH:bs:jl

cc: St. Clairsville District Office

## ALTERNATE SEDIMENTATION CONTROLS

The areas designated as topsoil stockpiles will be seeded with an appropriate grass and legume mixture. The grass lined diversion ditches surrounding the pile will be stabilized with straw bale dams, placed on 50' centers.

March 14, 1985

Mr. Larry Mamone  
Department of Reclamation  
Ohio Department of Natural Resources

Dear Sir:

We would like to draw your attention to the proposed modifications of NACCO Mining Company's Mine #6. We believe there are major factors to be considered:

- 1) Inadequate access road  
The proposed access road is located on a hazardous blind hill. We believe this will lead to many incidents involving coal related vehicles and the general public.
- 2) Unacceptable noise and vibration level  
The proposed location of the exhaust fan is extremely close to valuable homesites. The noise and vibration of this fan will greatly diminish the quality of life now enjoyed by the community residents.
- 3) Reduction of property value  
The location of this facility practically reduces the resale value of approximately thirteen homesites.
- 4) Safety and well being of residents  
We believe the increased traffic flow will present a new danger to the local residents. This area has many young families with children and possible future children whose safety must be of concern.
- 5) Inadequate roadway  
State Route 9 will be unable to handle the increased traffic flow created by NACCO employees traveling to and from work.

These are just a few of the many problems this will create for the community.

We would like to request a conference with you to fully discuss the impact of the proposed facility. The limitations of this letter do not permit a complete review of the situation. We appreciate your consideration and are awaiting your response. We urge you to accept our request for conference as time is of the essence. Again thank you.

Mr. & Mrs. William R. Ewing  
 Mrs. Mrs. David Napier  
 Mr. & Mrs. Aaron V. Piley  
 Mr. & Mrs. Allan A. Pack

Greg G. Dornon  
 Bruce M. Dornon  
 Sincerely,

Mr. & Mrs. Greg Baumberg  
 Mr. & Mrs. Royce Liddi  
 Mrs. Linda S. Liddi  
 Concerned Families  
 K. Bobb  
 Kathleen M. Carr  
 Mrs. Mrs. W. P. L. D. L.

# THE NACCO MINING COMPANY

POWHATAN POINT, OHIO 43942

March 28, 1985

Mr. Larry Mamone, Chief  
Division of Reclamation  
Department of Natural Resources  
Fountain Square, Building B  
Columbus, OH 43224

Dear Mr. Mamone:

The attached items are to be included with the previously submitted Application for Incidental Boundary Revision to Permit No. D-0360. This IBR covered 6.40 acres at the Air Shaft No. 4 site.

It is my hope that these items will complete this application. The permit fee and bond amount are being forwarded to your office under separate cover.

If you should require additional information, please call me.

Very truly yours,

THE NACCO MINING COMPANY



Louise Watson  
Permit Coordinator

LW:jlr  
Attachments